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1st ed.

THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1 8 9 0

FIRST EDITION

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS

WASHINGTON:
BUREAU OF NAVIGATION.
1887.

JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.

Approved, February 11, 1880

PREFACE.

THE arrangement of *The American Ephemeris* adopted in the volume for the year 1882, and explained in the Appendix to that volume, has been continued without radical change to the present time.

The additions then made comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets. The work is divided into three parts, as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the heliocentric and geocentric positions of the major planets, the Ephemeris of the Sun, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and the data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient.

SIMON NEWCOMB,

Professor U. S. Navy, Superintendent.

WASHINGTON, July 27, 1887.

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CORRECTIONS.

Ephemeris for 1887 (First Edition only).

Page 294,	f Tauri, in last column,	for 12.753	read 12.513
296,	Dec. of α Hydræ,	" +	" —
297,	In all copies of Ephemeris from 1882 to 1887,	" 31 Coronæ Borealis	" 31 Comæ Berenices
298,	ϵ Cassiopeiæ, last column,	" +	" —
298,	Dec. of β Coronæ Borealis,	" 46''.92	" 43''.92
299,	Groomb. 944, Ann. Var. in R. A.,	" —	" +
300,	1 Draconis (H.) in R. A.,	" 57°.747	" 54°.747
511,	16th line from bottom,	" γ	" Y
512,	Annapolis mean time of Emersion,	" 5 ^h	" 6 ^h

The American Nautical Almanac for 1888 (First Edition).

Page 248,	Ann. Var. in Dec. of δ Orionis,	for —2' .93	read +2''.93
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Ephemeris for 1888 (First Edition).

Page 293,	R. A. of 6 Ursæ Minoris,	for 20°.008	read 20°.080
294,	47 Cephei (H.) Ann. Var. in R. A.,	" +7°.5152	" +7°.7152
297,	β Chamæleontis, " "	" +3°.3706	" +3°.3996
297,	α Canum Venat., " "	"	" +2°.8157
298,	4 Ursæ Minoris, " "	" —0°.3349	" —0°.3249
298,	ρ Bootis, Ann. Var. in Dec ,	" —15''.695	" —15''.965
299,	δ Ursæ Minoris, Dec.,	" 20''.24	" 40''.24
300,	θ Lyræ, R. A.,	" 30°.791	" 28°.791
302 to 312,	To the R. A. of α Ursæ Minoris apply the correction —0°.04		
322,	Dec. of 11 Orionis,	for South	read North.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1890, WHICH COMPRISES THE LATTER PART OF THE 114TH AND THE BEGINNING OF THE 115TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6603 of the Julian Period;

- “ 7398-99 of the Byzantine era, the year 7399 commencing on September 1st;
- “ 5650-51 of the Jewish era, the year 5651 commencing on September 15th, or, more exactly, at sunset on September 14th;
- “ 2643 since the foundation of Rome, according to VARRO;
- “ 2637 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- “ 2666 of the Olympiads, or the second year of the 667th Olympiad commencing in July, 1890, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
- “ 2202 of the Grecian era, or the era of the Seleucidæ;
- “ 1606 of the era of DIOCLETIAN;
- “ 2550 of the Japanese era and to the 23d year of the period entitled “Meiji.”

The year 1308 of the Mohammedan era, or the era of the Hegira, begins on the 17th day of August, 1890.

The first day of January of the year 1890 is the 2,411,369th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	E	Solar Cycle	23
Epart	9	Roman Indiction	3
Lunar Cycle or Golden Number	10	Julian Period	6603

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	{	1. ♈	Aries.	Autumn Signs.	{	7. ♎	Libra.
		2. ♉	Taurus.			8. ♏	Scorpius.
		3. ♊	Gemini.			9. ♐	Sagittarius.
Summer Signs.	{	4. ♋	Cancer.	Winter Signs.	{	10. ♑	Capricornus.
		5. ♌	Leo.			11. ♒	Aquarius.
		6. ♍	Virgo.			12. ♓	Pisces.

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing 90° in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

P A R T I .

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Wed.	1	^h 18 ^m 48 ^s 15.72	^s 11.037	S. 22° 59' 22.8"	+12.74	16' 18.43	^s 71.08	^m 3 53.92	^s 1.177
Thur.	2	18 52 40.42	11.021	22 54 3.6	13.88	16 18.43	71.03	4 21.98	1.162
Frid.	3	18 57 4.74	11.004	22 48 17.1	15.00	16 18.43	70.98	4 49.67	1.145
Sat.	4	19 1 28.66	10.987	22 42 3.4	+16.13	16 18.42	70.92	5 16.95	1.128
SUN.	5	19 5 52.15	10.968	22 35 22.8	17.25	16 18.40	70.86	5 43.80	1.109
Mon.	6	19 10 15.18	10.949	22 28 15.3	18.36	16 18.38	70.80	6 10.20	1.090
Tues.	7	19 14 37.73	10.929	22 20 41.3	+19.46	16 18.35	70.73	6 36.12	1.070
Wed.	8	19 18 59.77	10.908	22 12 40.9	20.55	16 18.31	70.66	7 1.54	1.049
Thur.	9	19 23 21.30	10.886	22 4 14.4	21.63	16 18.27	70.59	7 26.44	1.027
Frid.	10	19 27 42.28	10.863	21 55 22.0	+22.71	16 18.22	70.51	7 50.80	1.004
Sat.	11	19 32 2.70	10.839	21 46 4.0	23.78	16 18.17	70.43	8 14.60	0.980
SUN.	12	19 36 22.54	10.814	21 36 20.6	24.83	16 18.11	70.35	8 37.82	0.955
Mon.	13	19 40 41.76	10.789	21 26 12.2	+25.87	16 18.05	70.27	9 0.42	0.930
Tues.	14	19 45 0.36	10.762	21 15 39.0	26.90	16 17.98	70.18	9 22.40	0.903
Wed.	15	19 49 18.32	10.735	21 4 41.2	27.91	16 17.90	70.09	9 43.75	0.876
Thur.	16	19 53 35.62	10.707	20 53 19.0	+28.91	16 17.82	69.99	10 4.43	0.848
Frid.	17	19 57 52.22	10.678	20 41 33.0	29.90	16 17.74	69.89	10 24.43	0.819
Sat.	18	20 2 8.12	10.648	20 29 23.5	30.88	16 17.65	69.79	10 43.72	0.790
SUN.	19	20 6 23.30	10.618	20 16 50.7	+31.84	16 17.56	69.69	11 2.29	0.760
Mon.	20	20 10 37.74	10.587	20 3 55.0	32.79	16 17.46	69.58	11 20.12	0.729
Tues.	21	20 14 51.42	10.555	19 50 36.8	33.72	16 17.36	69.48	11 37.20	0.697
Wed.	22	20 19 4.33	10.523	19 36 56.5	+34.64	16 17.26	69.37	11 53.51	0.665
Thur.	23	20 23 16.45	10.490	19 22 54.3	35.54	16 17.16	69.26	12 9.03	0.632
Frid.	24	20 27 27.77	10.456	19 8 30.6	36.42	16 17.05	69.15	12 23.75	0.598
Sat.	25	20 31 38.27	10.421	18 53 45.9	+37.29	16 16.94	69.04	12 37.66	0.564
SUN.	26	20 35 47.95	10.386	18 38 40.6	38.14	16 16.82	68.93	12 50.75	0.529
Mon.	27	20 39 56.80	10.351	18 23 15.0	38.98	16 16.70	68.82	13 3.01	0.494
Tues.	28	20 44 4.82	10.316	18 7 29.5	+39.80	16 16.58	68.70	13 14.43	0.459
Wed.	29	20 48 11.99	10.281	17 51 24.6	40.60	16 16.45	68.59	13 25.02	0.424
Thur.	30	20 52 18.32	10.246	17 35 0.7	41.39	16 16.32	68.47	13 34.77	0.389
Frid.	31	20 56 23.81	10.211	17 18 18.1	42.16	16 16.18	68.36	13 43.68	0.354
Sat.	32	21 0 28.45	10.176	S. 17 1 17.3	+42.91	16 16.04	68.24	13 51.75	0.319

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Wed.	1	^h 18 ^m 48 ^s 15.01	11.033	S. 22° 59' 23.6"	+12.74	^m 3 ^s 53.84	1.177	^h 18 ^m 44 ^s 21.16
Thur.	2	18 52 39.62	11.018	22 54 4.6	13.87	4 21.90	1.162	18 48 17.72
Frid.	3	18 57 3.86	11.001	22 48 18.3	14.99	4 49.58	1.145	18 52 14.28
Sat.	4	19 1 27.70	10.984	22 42 4.8	+16.12	5 16.86	1.128	18 56 10.84
SUN.	5	19 5 51.10	10.965	22 35 24.4	17.24	5 43.70	1.109	19 0 7.40
Mon.	6	19 10 14.05	10.946	22 28 17.2	18.35	6 10.09	1.090	19 4 3.96
Tues.	7	19 14 36.52	10.926	22 20 43.4	+19.45	6 36.01	1.070	19 8 0.51
Wed.	8	19 18 58.49	10.905	22 12 43.3	20.54	7 1.42	1.049	19 11 57.07
Thur.	9	19 23 19.95	10.883	22 4 17.1	21.62	7 26.32	1.027	19 15 53.63
Frid.	10	19 27 40.86	10.860	21 55 25.0	+22.70	7 50.68	1.004	19 19 50.19
Sat.	11	19 32 1.21	10.836	21 46 7.3	23.77	8 14.47	0.980	19 23 46.74
SUN.	12	19 36 20.98	10.811	21 36 24.2	24.82	8 37.68	0.955	19 27 43.30
Mon.	13	19 40 40.14	10.786	21 26 16.1	+25.86	9 0.28	0.930	19 31 39.86
Tues.	14	19 44 58.68	10.759	21 15 43.2	26.89	9 22.26	0.903	19 35 36.42
Wed.	15	19 49 16.58	10.732	21 4 45.6	27.90	9 43.61	0.876	19 39 32.97
Thur.	16	19 53 33.82	10.704	20 53 23.8	+28.90	10 4.29	0.848	19 43 29.53
Frid.	17	19 57 50.37	10.675	20 41 38.2	29.89	10 24.29	0.819	19 47 26.08
Sat.	18	20 2 6.22	10.646	20 29 29.0	30.87	10 43.58	0.790	19 51 22.64
SUN.	19	20 6 21.35	10.616	20 16 56.6	+31.83	11 2.15	0.760	19 55 19.20
Mon.	20	20 10 35.74	10.585	20 4 1.2	32.78	11 19.98	0.729	19 59 15.76
Tues.	21	20 14 49.38	10.553	19 50 43.3	33.71	11 37.07	0.697	20 3 12.31
Wed.	22	20 19 2.25	10.521	19 37 3.3	+34.63	11 53.38	0.665	20 7 8.87
Thur.	23	20 23 14.33	10.488	19 23 1.4	35.53	12 8.90	0.633	20 11 5.43
Frid.	24	20 27 25.61	10.454	19 8 38.1	36.41	12 23.63	0.598	20 15 1.99
Sat.	25	20 31 36.08	10.420	18 53 53.7	+37.28	12 37.55	0.564	20 18 58.54
SUN.	26	20 35 45.73	10.385	18 38 48.7	38.13	12 50.64	0.529	20 22 55.10
Mon.	27	20 39 54.55	10.350	18 23 23.4	38.97	13 2.90	0.494	20 26 51.65
Tues.	28	20 44 2.54	10.315	18 7 38.2	+39.79	13 14.33	0.459	20 30 48.21
Wed.	29	20 48 9.69	10.280	17 51 33.6	40.59	13 24.93	0.424	20 34 44.76
Thur.	30	20 52 16.00	10.245	17 35 10.0	41.38	13 34.69	0.389	20 38 41.32
Frid.	31	20 56 21.47	10.210	17 18 27.7	42.15	13 48.60	0.354	20 42 37.87
Sat.	32	21 0 26.10	10.175	S. 17 1 27.2	+42.90	13 51.67	0.319	20 46 34.43

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+9".8565.
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		λ	λ'						
1	1	281° 5' 51.1	6' 7.8	152.88	— 0.35	9.9926458	— 0.9	^h 5 ^m 14 ^s 47.13	
2	2	282 7 0.2	7 16.7	152.87	0.24	9.9926451	+ 0.3	5 10 51.22	
3	3	283 8 9.0	8 25.3	152.86	— 0.12	9.9926470	1.3	5 6 55.31	
4	4	284 9 17.5	9 33.7	152.85	+ 0.01	9.9926516	+ 2.5	5 2 59.40	
5	5	285 10 25.9	10 41.9	152.84	0.15	9.9926590	3.7	4 59 3.49	
6	6	286 11 34.1	11 49.9	152.83	0.28	9.9926693	4.9	4 55 7.57	
7	7	287 12 42.1	12 57.7	152.83	+ 0.40	9.9926824	+ 6.1	4 51 11.66	
8	8	288 13 49.9	14 5.3	152.82	0.51	9.9926984	7.2	4 47 15.74	
9	9	289 14 57.5	15 12.7	152.82	0.60	9.9927171	8.4	4 43 19.82	
10	10	290 16 5.0	16 20.1	152.81	+ 0.67	9.9927385	+ 9.5	4 39 23.91	
11	11	291 17 12.5	17 27.4	152.81	0.70	9.9927626	10.6	4 35 28.00	
12	12	292 18 19.8	18 34.5	152.80	0.71	9.9927892	11.6	4 31 32.09	
13	13	293 19 27.0	19 41.5	152.80	+ 0.68	9.9928182	+12.6	4 27 36.18	
14	14	294 20 34.0	20 48.4	152.79	0.63	9.9928494	13.5	4 23 40.27	
15	15	295 21 40.8	21 55.1	152.78	0.55	9.9928827	14.3	4 19 44.36	
16	16	296 22 47.4	23 1.5	152.77	+ 0.44	9.9929179	+15.1	4 15 48.45	
17	17	297 23 53.7	24 7.6	152.75	0.32	9.9929549	15.8	4 11 52.53	
18	18	298 24 59.5	25 13.3	152.73	0.20	9.9929937	16.5	4 7 56.62	
19	19	299 26 4.7	26 18.4	152.71	+ 0.07	9.9930342	+17.2	4 4 0.71	
20	20	300 27 9.4	27 22.9	152.68	— 0.06	9.9930762	17.8	4 0 4.80	
21	21	301 28 13.4	28 26.7	152.65	0.18	9.9931197	18.5	3 56 8.90	
22	22	302 29 16.7	29 29.8	152.62	— 0.27	9.9931647	+19.1	3 52 12.99	
23	23	303 30 19.2	30 32.1	152.58	0.34	9.9932113	19.7	3 48 17.08	
24	24	304 31 20.7	31 33.4	152.54	0.39	9.9932595	20.4	3 44 21.16	
25	25	305 32 21.0	32 33.6	152.49	— 0.41	9.9933093	+21.1	3 40 25.25	
26	26	306 33 20.1	33 32.6	152.44	0.39	9.9933607	21.8	3 36 29.34	
27	27	307 34 18.1	34 30.4	152.39	0.34	9.9934139	22.6	3 32 33.43	
28	28	308 35 14.9	35 27.1	152.33	— 0.27	9.9934690	+23.4	3 28 37.52	
29	29	309 36 10.4	36 22.5	152.28	0.18	9.9935261	24.2	3 24 41.61	
30	30	310 37 4.5	37 16.5	152.22	— 0.06	9.9935853	25.1	3 20 45.70	
31	31	311 37 57.3	38 9.1	152.17	+ 0.07	9.9936467	26.0	3 16 49.79	
32	32	312 38 48.8	39 0.4	152.12	+ 0.21	9.9937105	+27.0	3 12 53.88	
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0.									Diff. for 1 Hour, — 9 ^h .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

Day of the Moon	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15' 2.1	14' 58.4	55' 3.9	-1.20	54' 50.4	-1.05	^h 8 ^m 43.4	^m 1.90	^d 10.0
2	14 55.3	14 52.5	54 38.7	0.91	54 28.5	0.79	9 29.6	1.96	11.0
3	14 50.1	14 48.2	54 19.9	0.66	54 12.8	0.54	10 17.2	2.01	12.0
4	14 46.6	14 45.5	54 7.1	-0.42	54 2.7	-0.31	11 5.9	2.04	13.0
5	14 44.6	14 44.1	53 59.6	-0.21	53 57.8	-0.10	11 55.3	2.06	14.0
6	14 44.0	14 44.1	53 57.2	0.00	53 57.8	+0.11	12 44.6	2.03	15.0
7	14 44.7	14 45.5	53 59.8	+0.22	54 3.0	+0.33	13 32.9	1.98	16.0
8	14 46.8	14 48.5	54 7.7	0.45	54 13.8	0.57	14 19.8	1.92	17.0
9	14 50.6	14 53.1	54 21.4	0.70	54 30.6	0.84	15 5.1	1.84	18.0
10	14 56.0	14 59.4	54 41.6	+0.99	54 54.3	+1.13	15 49.2	1.80	19.0
11	15 3.4	15 7.9	55 8.8	1.29	55 25.3	1.45	16 32.6	1.82	20.0
12	15 13.0	15 18.5	55 43.6	1.61	56 3.8	1.76	17 16.1	1.86	21.0
13	15 24.5	15 30.9	56 25.9	+1.91	56 49.6	+2.04	18 0.8	1.93	22.0
14	15 37.7	15 44.9	57 14.8	2.15	57 41.2	2.24	18 47.9	2.03	23.0
15	15 52.4	16 0.0	58 8.5	2.30	58 36.3	2.31	19 38.5	2.20	24.0
16	16 7.5	16 14.8	59 4.0	+2.28	59 31.0	+2.20	20 33.6	2.39	25.0
17	16 21.8	16 28.3	59 56.7	2.06	60 20.4	1.86	21 33.4	2.57	26.0
18	16 34.0	16 38.7	60 41.3	1.60	60 58.7	1.28	22 37.2	2.69	27.0
19	16 42.3	16 44.7	61 12.0	+0.92	61 20.8	+0.52	23 42.5	2.69	28.0
20	16 45.7	16 45.4	61 24.5	+0.10	61 23.1	-0.33	♄		29.0
21	16 43.6	16 40.5	61 16.6	-0.75	61 5.2	1.14	0 46.6	2.59	0.5
22	16 36.1	16 30.7	60 49.2	-1.50	60 29.2	-1.81	1 47.1	2.43	1.5
23	16 24.3	16 17.3	60 5.9	2.05	59 40.0	2.24	2 43.1	2.27	2.5
24	16 9.7	16 1.9	59 12.3	2.36	58 43.4	2.43	3 34.9	2.09	3.5
25	15 53.9	15 46.0	58 14.0	-2.44	57 44.9	-2.40	4 23.4	1.96	4.5
26	15 38.2	15 30.8	57 16.5	2.32	56 49.2	2.21	5 9.8	1.91	5.5
27	15 23.8	15 17.3	56 23.5	2.06	55 59.7	1.91	5 55.3	1.89	6.5
28	15 11.3	15 6.0	55 37.8	-1.73	55 18.2	-1.55	6 40.6	1.90	7.5
29	15 1.2	14 57.1	55 0.7	1.36	54 45.6	1.17	7 26.7	1.94	8.5
30	14 53.6	14 50.7	54 32.7	0.98	54 22.1	0.80	8 13.9	1.99	9.5
31	14 48.4	14 46.7	54 13.6	0.62	54 7.2	0.45	9 2.2	2.03	10.5
32	14 45.5	14 44.7	54 2.7	-0.30	54 0.0	-0.15	9 51.3	2.05	11.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
0	^h 3 ^m 11 ^s 50.34	1.9880	N.14° 3' 26.7"	10.133	0	^h 4 ^m 49 ^s 30.21	2.0874	N.20° 40' 34.9"	6.161
1	3 13 49.55	1.9877	14 13 34.7	10.065	1	4 51 35.52	2.0896	20 46 42.9	6.085
2	3 15 48.86	1.9894	14 23 36.5	9.996	2	4 53 40.96	2.0917	20 52 45.1	5.987
3	3 17 48.27	1.9911	14 33 34.2	9.927	3	4 55 46.53	2.0938	20 58 41.4	5.889
4	3 19 47.79	1.9929	14 43 27.7	9.857	4	4 57 52.22	2.0959	21 4 31.8	5.791
5	3 21 47.42	1.9947	14 53 17.0	9.787	5	4 59 58.04	2.0980	21 10 16.3	5.692
6	3 23 47.16	1.9966	15 3 2.1	9.717	6	5 2 3.98	2.1000	21 15 54.9	5.594
7	3 25 47.01	1.9984	15 12 43.0	9.645	7	5 4 10.04	2.1021	21 21 27.6	5.495
8	3 27 46.97	2.0003	15 22 19.5	9.579	8	5 6 16.23	2.1042	21 26 54.3	5.395
9	3 29 47.05	2.0022	15 31 51.7	9.509	9	5 8 22.54	2.1063	21 32 15.0	5.294
10	3 31 47.24	2.0042	15 41 19.5	9.437	10	5 10 28.97	2.1081	21 37 29.6	5.192
11	3 33 47.55	2.0062	15 50 42.9	9.359	11	5 12 35.51	2.1100	21 42 38.1	5.091
12	3 35 47.98	2.0082	16 0 1.8	9.277	12	5 14 42.17	2.1119	21 47 40.5	4.989
13	3 37 48.53	2.0102	16 9 16.2	9.202	13	5 16 48.94	2.1138	21 52 36.8	4.887
14	3 39 49.20	2.0122	16 18 26.1	9.127	14	5 18 55.83	2.1157	21 57 27.0	4.785
15	3 41 50.00	2.0143	16 27 31.4	9.050	15	5 21 2.83	2.1176	22 2 11.0	4.682
16	3 43 50.92	2.0164	16 36 32.1	8.979	16	5 23 9.94	2.1194	22 6 48.8	4.578
17	3 45 51.97	2.0186	16 45 28.1	8.894	17	5 25 17.15	2.1211	22 11 20.4	4.475
18	3 47 53.15	2.0207	16 54 19.4	8.816	18	5 27 24.47	2.1228	22 15 45.8	4.371
19	3 49 54.46	2.0228	17 3 6.0	8.737	19	5 29 31.89	2.1245	22 20 4.9	4.266
20	3 51 55.89	2.0249	17 11 47.8	8.657	20	5 31 39.41	2.1262	22 24 17.7	4.160
21	3 53 57.45	2.0271	17 20 24.8	8.577	21	5 33 47.04	2.1279	22 28 24.1	4.054
22	3 55 59.14	2.0293	17 28 57.0	8.496	22	5 35 54.76	2.1295	22 32 24.2	3.948
23	3 58 0.96	2.0314	N.17 37 24.3	8.414	23	5 38 2.58	2.1311	N.22 36 17.9	3.842
THURSDAY 2.					SATURDAY 4.				
0	4 0 2.91	2.0336	N.17 45 46.6	8.331	0	5 40 10.49	2.1326	N.22 40 5.3	3.736
1	4 2 5.00	2.0359	17 54 4.0	8.248	1	5 42 18.49	2.1341	22 43 46.3	3.629
2	4 4 7.22	2.0381	18 2 16.4	8.165	2	5 44 26.58	2.1355	22 47 20.8	3.522
3	4 6 9.57	2.0403	18 10 23.8	8.081	3	5 46 34.75	2.1369	22 50 48.9	3.414
4	4 8 12.06	2.0426	18 18 26.1	7.996	4	5 48 43.01	2.1383	22 54 10.5	3.307
5	4 10 14.68	2.0448	18 26 23.3	7.911	5	5 50 51.35	2.1396	22 57 25.7	3.199
6	4 12 17.44	2.0471	18 34 15.4	7.825	6	5 52 59.76	2.1409	23 0 34.4	3.091
7	4 14 20.33	2.0493	18 42 2.3	7.739	7	5 55 8.25	2.1421	23 3 36.6	2.982
8	4 16 23.36	2.0516	18 49 44.0	7.652	8	5 57 16.81	2.1432	23 6 32.2	2.872
9	4 18 26.53	2.0539	18 57 20.5	7.564	9	5 59 25.44	2.1444	23 9 21.3	2.763
10	4 20 29.83	2.0561	19 4 51.7	7.476	10	6 1 34.14	2.1455	23 12 3.8	2.653
11	4 22 33.26	2.0583	19 12 17.6	7.387	11	6 3 42.90	2.1466	23 14 39.7	2.544
12	4 24 36.83	2.0606	19 19 38.1	7.297	12	6 5 51.73	2.1477	23 17 9.1	2.435
13	4 26 40.54	2.0629	19 26 53.2	7.207	13	6 8 0.62	2.1488	23 19 31.9	2.324
14	4 28 44.38	2.0652	19 34 2.9	7.117	14	6 10 9.56	2.1498	23 21 48.0	2.213
15	4 30 48.36	2.0675	19 41 7.2	7.026	15	6 12 18.56	2.1504	23 23 57.5	2.103
16	4 32 52.48	2.0697	19 48 6.0	6.934	16	6 14 27.61	2.1512	23 26 0.4	1.992
17	4 34 56.73	2.0719	19 54 59.3	6.841	17	6 16 36.70	2.1519	23 27 56.6	1.881
18	4 37 1.11	2.0742	20 1 47.0	6.748	18	6 18 45.83	2.1526	23 29 46.1	1.770
19	4 39 5.63	2.0764	20 8 29.1	6.655	19	6 20 55.01	2.1533	23 31 29.0	1.659
20	4 41 10.28	2.0786	20 15 5.6	6.562	20	6 23 4.23	2.1539	23 33 5.2	1.547
21	4 43 15.06	2.0808	20 21 36.5	6.467	21	6 25 13.48	2.1544	23 34 34.7	1.436
22	4 45 19.98	2.0831	20 28 1.7	6.373	22	6 27 22.76	2.1550	23 35 57.5	1.324
23	4 47 25.03	2.0853	20 34 21.2	6.277	23	6 29 32.08	2.1556	23 37 13.6	1.213
24	4 49 30.21	2.0874	N.20 40 34.9	6.181	24	6 31 41.43	2.1560	N.23 38 23.0	1.101

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 5.					TUESDAY 7.				
0	6 31 41.43	2.1560	N.23 38' 23.0	1.101	0	8 14 39.25	2.1154	N.22 23' 2.8	4.178
1	6 33 50.80	2.1563	23 39 25.7	0.988	1	8 16 46.12	2.1135	22 18 49.4	4.375
2	6 36 0.18	2.1565	23 40 21.6	0.876	2	8 18 52.87	2.1115	22 14 29.8	4.378
3	6 38 9.58	2.1568	23 41 10.8	0.764	3	8 20 59.50	2.1095	22 10 4.0	4.481
4	6 40 19.00	2.1571	23 41 53.3	0.652	4	8 23 6.01	2.1074	22 5 32.1	4.583
5	6 42 28.43	2.1572	23 42 29.1	0.540	5	8 25 12.39	2.1053	22 0 54.1	4.684
6	6 44 37.86	2.1573	23 42 58.1	0.427	6	8 27 18.65	2.1032	21 56 10.0	4.786
7	6 46 47.30	2.1573	23 43 20.4	0.315	7	8 29 24.78	2.1011	21 51 19.8	4.887
8	6 48 56.74	2.1573	23 43 35.9	0.203	8	8 31 30.78	2.0990	21 46 23.6	4.987
9	6 51 6.17	2.1572	23 43 44.7	+ 0.091	9	8 33 36.66	2.0968	21 41 21.4	5.087
10	6 53 15.60	2.1571	23 43 46.8	- 0.022	10	8 35 42.40	2.0946	21 36 13.2	5.188
11	6 55 25.02	2.1569	23 43 42.1	0.134	11	8 37 48.01	2.0923	21 30 59.1	5.288
12	6 57 34.43	2.1567	23 43 30.7	0.246	12	8 39 53.48	2.0901	21 25 39.0	5.384
13	6 59 43.82	2.1564	23 43 12.6	0.359	13	8 41 58.82	2.0878	21 20 13.0	5.481
14	7 1 53.19	2.1561	23 42 47.7	0.471	14	8 44 4.02	2.0855	21 14 41.2	5.578
15	7 4 2.55	2.1557	23 42 16.1	0.582	15	8 46 9.08	2.0832	21 9 3.6	5.675
16	7 6 11.88	2.1552	23 41 37.8	0.694	16	8 48 14.00	2.0808	21 3 20.2	5.772
17	7 8 21.18	2.1547	23 40 52.8	0.807	17	8 50 18.78	2.0785	20 57 31.0	5.867
18	7 10 30.45	2.1542	23 40 1.0	0.919	18	8 52 23.42	2.0761	20 51 36.1	5.962
19	7 12 39.68	2.1536	23 39 2.5	1.031	19	8 54 27.91	2.0737	20 45 35.5	6.057
20	7 14 48.88	2.1530	23 37 57.3	1.142	20	8 56 32.26	2.0713	20 39 29.2	6.152
21	7 16 58.04	2.1523	23 36 45.5	1.253	21	8 58 36.47	2.0689	20 33 17.2	6.246
22	7 19 7.15	2.1515	23 35 27.0	1.364	22	9 0 40.53	2.0665	20 26 59.7	6.339
23	7 21 16.22	2.1507	N.23 34 1.8	1.476	23	9 2 44.45	2.0641	N.20 20 36.6	6.432
MONDAY 6.					WEDNESDAY 8.				
0	7 23 25.24	2.1499	N.23 32 29.9	1.587	0	9 4 48.22	2.0616	N.20 14 7.9	6.524
1	7 25 34.21	2.1490	23 30 51.4	1.697	1	9 6 51.84	2.0591	20 7 33.7	6.615
2	7 27 43.12	2.1480	23 29 6.2	1.808	2	9 8 55.31	2.0566	20 0 54.1	6.706
3	7 29 51.97	2.1470	23 27 14.4	1.918	3	9 10 58.63	2.0541	19 54 9.0	6.797
4	7 32 0.76	2.1459	23 25 16.0	2.028	4	9 13 1.80	2.0516	19 47 18.5	6.888
5	7 34 9.48	2.1448	23 23 11.0	2.138	5	9 15 4.82	2.0492	19 40 22.7	6.974
6	7 36 18.13	2.1436	23 20 59.4	2.248	6	9 17 7.70	2.0467	19 33 21.6	7.063
7	7 38 26.71	2.1424	23 18 41.2	2.358	7	9 19 10.42	2.0441	19 26 15.2	7.151
8	7 40 35.22	2.1412	23 16 16.4	2.467	8	9 21 12.99	2.0416	19 19 3.5	7.238
9	7 42 43.66	2.1400	23 13 45.1	2.576	9	9 23 15.41	2.0391	19 11 46.6	7.325
10	7 44 52.02	2.1388	23 11 7.3	2.684	10	9 25 17.68	2.0366	19 4 24.5	7.412
11	7 47 0.29	2.1372	23 8 23.0	2.792	11	9 27 19.80	2.0341	18 56 57.2	7.498
12	7 49 8.48	2.1358	23 5 32.2	2.901	12	9 29 21.77	2.0316	18 49 24.7	7.583
13	7 51 16.59	2.1343	23 2 34.9	3.009	13	9 31 23.59	2.0291	18 41 47.2	7.667
14	7 53 24.60	2.1327	22 59 31.1	3.116	14	9 33 25.26	2.0265	18 34 4.7	7.750
15	7 55 32.52	2.1312	22 56 20.9	3.223	15	9 35 26.77	2.0240	18 26 17.2	7.833
16	7 57 40.34	2.1296	22 53 4.3	3.330	16	9 37 28.14	2.0216	18 18 24.7	7.916
17	7 59 48.07	2.1280	22 49 41.3	3.437	17	9 39 29.36	2.0191	18 10 27.3	7.998
18	8 1 55.70	2.1263	22 46 11.9	3.543	18	9 41 30.43	2.0166	18 2 25.0	8.079
19	8 4 3.22	2.1245	22 42 36.2	3.648	19	9 43 31.35	2.0141	17 54 17.8	8.160
20	8 6 10.64	2.1228	22 38 54.1	3.753	20	9 45 32.12	2.0117	17 46 5.8	8.240
21	8 8 17.96	2.1211	22 35 5.7	3.859	21	9 47 32.75	2.0092	17 37 49.0	8.319
22	8 10 25.17	2.1192	22 31 11.0	3.964	22	9 49 33.23	2.0067	17 29 27.5	8.398
23	8 12 32.27	2.1173	22 27 10.0	4.068	23	9 51 33.56	2.0043	17 21 1.3	8.476
24	8 14 39.25	2.1154	N.22 23 2.8	4.172	24	9 53 33.75	2.0019	N.17 12 30.4	8.553

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 9.					SATURDAY 11.				
0	9 53 33.75	1.9919	N. 17° 12' 30.4"	8.553	0	11 27 21.57	1.9900	N. 9° 4' 59.4"	11.508
1	9 55 33.79	1.9995	17 3 54.9	8.630	1	11 29 16.75	1.9192	8 53 27.5	11.553
2	9 57 33.69	1.9972	16 55 14.8	8.707	2	11 31 11.88	1.9185	8 41 53.0	11.598
3	9 59 33.45	1.9948	16 46 30.1	8.782	3	11 33 6.97	1.9179	8 30 15.8	11.642
4	10 1 33.07	1.9925	16 37 40.9	8.857	4	11 35 2.03	1.9175	8 18 36.0	11.685
5	10 3 32.55	1.9902	16 28 47.3	8.931	5	11 36 57.07	1.9171	8 6 53.6	11.728
6	10 5 31.89	1.9878	16 19 49.2	9.005	6	11 38 52.08	1.9166	7 55 8.6	11.771
7	10 7 31.09	1.9855	16 10 46.7	9.078	7	11 40 47.06	1.9162	7 43 21.1	11.812
8	10 9 30.15	1.9833	16 1 39.9	9.150	8	11 42 42.02	1.9159	7 31 31.2	11.853
9	10 11 29.08	1.9811	15 52 28.7	9.222	9	11 44 36.97	1.9156	7 19 38.8	11.893
10	10 13 27.88	1.9788	15 43 13.2	9.293	10	11 46 31.90	1.9154	7 7 44.0	11.932
11	10 15 26.54	1.9766	15 33 53.5	9.363	11	11 48 26.82	1.9153	6 55 46.9	11.970
12	10 17 25.07	1.9744	15 24 29.6	9.432	12	11 50 21.74	1.9152	6 43 47.6	12.007
13	10 19 23.47	1.9723	15 15 1.6	9.502	13	11 52 16.65	1.9152	6 31 46.0	12.045
14	10 21 21.74	1.9702	15 5 29.4	9.571	14	11 54 11.56	1.9153	6 19 42.2	12.083
15	10 23 19.89	1.9680	14 55 53.1	9.639	15	11 56 6.48	1.9154	6 7 36.1	12.119
16	10 25 17.92	1.9658	14 46 12.7	9.707	16	11 58 1.41	1.9156	5 55 27.9	12.154
17	10 27 15.82	1.9640	14 36 28.3	9.773	17	11 59 56.35	1.9158	5 43 17.7	12.188
18	10 29 13.60	1.9620	14 26 40.0	9.838	18	12 1 51.30	1.9160	5 31 5.4	12.221
19	10 31 11.26	1.9600	14 16 47.8	9.903	19	12 3 46.27	1.9164	5 18 51.1	12.254
20	10 33 8.80	1.9581	14 6 51.7	9.968	20	12 5 41.27	1.9168	5 6 34.9	12.287
21	10 35 6.23	1.9562	13 56 51.7	10.033	21	12 7 36.29	1.9172	4 54 16.7	12.319
22	10 37 3.54	1.9543	13 46 47.8	10.098	22	12 9 31.34	1.9177	4 41 56.6	12.350
23	10 39 0.74	1.9525	N. 13° 36' 40.2"	10.158	23	12 11 26.42	1.9183	N. 4° 29' 34.7"	12.380
FRIDAY 10.					SUNDAY 12.				
0	10 40 57.84	1.9507	N. 13° 26' 28.9"	10.219	0	12 13 21.54	1.9190	N. 4° 17' 11.0"	12.410
1	10 42 54.83	1.9489	13 16 13.9	10.281	1	12 15 16.70	1.9197	4 4 45.5	12.439
2	10 44 51.71	1.9472	13 5 55.2	10.342	2	12 17 11.91	1.9205	3 52 18.3	12.467
3	10 46 48.49	1.9455	12 55 32.9	10.401	3	12 19 7.16	1.9213	3 39 49.5	12.494
4	10 48 45.17	1.9438	12 45 7.1	10.460	4	12 21 2.47	1.9223	3 27 19.1	12.520
5	10 50 41.75	1.9422	12 34 37.7	10.519	5	12 22 57.84	1.9233	3 14 47.1	12.546
6	10 52 38.24	1.9407	12 24 4.8	10.577	6	12 24 53.27	1.9244	3 2 13.5	12.572
7	10 54 34.64	1.9392	12 13 28.5	10.634	7	12 26 48.77	1.9255	2 49 38.4	12.597
8	10 56 30.94	1.9376	12 2 48.7	10.691	8	12 28 44.33	1.9266	2 37 1.8	12.621
9	10 58 27.15	1.9362	11 52 5.5	10.747	9	12 30 39.96	1.9278	2 24 23.9	12.643
10	11 0 23.28	1.9347	11 41 19.0	10.802	10	12 32 35.67	1.9292	2 11 44.7	12.664
11	11 2 19.32	1.9333	11 30 29.2	10.857	11	12 34 31.47	1.9307	1 59 4.2	12.686
12	11 4 15.28	1.9320	11 19 36.1	10.912	12	12 36 27.35	1.9321	1 46 22.4	12.707
13	11 6 11.16	1.9308	11 8 39.8	10.965	13	12 38 23.32	1.9336	1 33 39.3	12.727
14	11 8 6.97	1.9296	10 57 40.3	11.017	14	12 40 19.38	1.9352	1 20 55.1	12.746
15	11 10 2.71	1.9284	10 46 37.7	11.069	15	12 42 15.54	1.9369	1 8 9.8	12.764
16	11 11 58.38	1.9273	10 35 32.0	11.121	16	12 44 11.81	1.9387	0 55 23.4	12.782
17	11 13 53.98	1.9262	10 24 23.2	11.172	17	12 46 8.18	1.9404	0 42 35.9	12.800
18	11 15 49.52	1.9252	10 13 11.4	11.222	18	12 48 4.66	1.9422	0 29 47.4	12.817
19	11 17 45.00	1.9242	10 1 56.6	11.271	19	12 50 1.25	1.9442	0 16 57.9	12.832
20	11 19 40.42	1.9232	9 50 38.9	11.319	20	12 51 57.96	1.9463	N. 0° 4' 7.6"	12.845
21	11 21 35.78	1.9222	9 39 18.3	11.367	21	12 53 54.80	1.9484	S. 0° 8' 43.5"	12.858
22	11 23 31.09	1.9214	9 27 54.2	11.415	22	12 55 51.77	1.9506	0 21 35.4	12.871
23	11 25 26.35	1.9207	9 16 28.5	11.462	23	12 57 48.87	1.9528	0 34 26.1	12.884
24	11 27 21.57	1.9200	N. 9° 4' 59.4"	11.508	24	12 59 46.11	1.9551	S. 0° 47' 21.5"	12.896

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					WEDNESDAY 15.				
0	12 ^h 59 ^m 46.11	1.9661	S. 0° 47' 21.5	12.896	0	14 ^h 37 ^m 42.38	2.1545	S. 11° 1' 25.4	12.923
1	13 1 43.49	1.9675	1 0 15.6	12.906	1	14 39 51.83	2.1665	11 13 41.2	12.943
2	13 3 41.01	1.9690	1 13 10.2	12.914	2	14 42 1.64	2.1698	11 25 54.5	12.961
3	13 5 38.68	1.9695	1 26 5.3	12.923	3	14 44 11.82	2.1797	11 38 5.3	12.157
4	13 7 36.51	1.9699	1 39 0.9	12.931	4	14 46 22.37	2.1789	11 50 13.4	12.112
5	13 9 34.50	1.9678	1 51 57.0	12.938	5	14 48 33.29	2.1851	12 2 18.7	12.064
6	13 11 32.65	1.9705	2 4 53.5	12.944	6	14 50 44.58	2.1913	12 14 21.1	12.016
7	13 13 30.96	1.9733	2 17 50.3	12.949	7	14 52 56.25	2.1977	12 26 20.6	11.967
8	13 15 29.45	1.9763	2 30 47.4	12.954	8	14 55 8.31	2.2041	12 38 17.2	11.917
9	13 17 28.12	1.9793	2 43 44.8	12.957	9	14 57 20.75	2.2106	12 50 10.7	11.865
10	13 19 26.97	1.9823	2 56 42.3	12.959	10	14 59 33.58	2.2179	13 2 1.0	11.811
11	13 21 26.00	1.9854	3 9 39.9	12.961	11	15 1 46.81	2.2238	13 13 48.0	11.755
12	13 23 25.22	1.9886	3 22 37.6	12.962	12	15 4 0.44	2.2305	13 25 31.6	11.698
13	13 25 24.63	1.9919	3 35 35.3	12.961	13	15 6 14.47	2.2372	13 37 11.8	11.641
14	13 27 24.25	1.9953	3 48 32.9	12.960	14	15 8 28.90	2.2439	13 48 48.5	11.581
15	13 29 24.07	1.9987	4 1 30.5	12.958	15	15 10 43.74	2.2507	14 0 21.5	11.519
16	13 31 24.10	2.0022	4 14 27.9	12.955	16	15 12 58.99	2.2576	14 11 50.8	11.457
17	13 33 24.34	2.0058	4 27 25.1	12.951	17	15 15 14.66	2.2646	14 23 16.3	11.392
18	13 35 24.80	2.0095	4 40 22.0	12.946	18	15 17 30.74	2.2715	14 34 37.9	11.326
19	13 37 25.48	2.0133	4 53 18.6	12.940	19	15 19 47.24	2.2786	14 45 55.4	11.267
20	13 39 26.39	2.0171	5 6 14.8	12.932	20	15 22 4.17	2.2857	14 57 8.8	11.198
21	13 41 27.53	2.0209	5 19 10.5	12.924	21	15 24 21.52	2.2928	15 8 18.0	11.117
22	13 43 28.90	2.0249	5 32 5.7	12.915	22	15 26 39.30	2.2999	15 19 22.9	11.045
23	13 45 30.52	2.0290	S. 5 45 0.3	12.905	23	15 28 57.51	2.3079	S. 15 30 23.4	10.979
TUESDAY 14.					THURSDAY 16.				
0	13 47 32.38	2.0331	S. 5 57 54.3	12.894	0	15 31 16.16	2.3144	S. 15 41 19.5	10.897
1	13 49 34.49	2.0373	6 10 47.6	12.889	1	15 33 35.24	2.3217	15 52 11.0	10.819
2	13 51 36.86	2.0416	6 23 40.1	12.886	2	15 35 54.76	2.3290	16 2 57.8	10.739
3	13 53 39.49	2.0460	6 36 31.8	12.884	3	15 38 14.72	2.3363	16 13 39.7	10.658
4	13 55 42.38	2.0504	6 49 22.6	12.889	4	15 40 35.12	2.3437	16 24 16.7	10.576
5	13 57 45.53	2.0548	7 2 12.5	12.893	5	15 42 55.97	2.3512	16 34 48.8	10.499
6	13 59 48.95	2.0594	7 15 1.3	12.894	6	15 45 17.26	2.3586	16 45 15.8	10.407
7	14 1 52.65	2.0641	7 27 49.0	12.786	7	15 47 39.00	2.3661	16 55 37.6	10.319
8	14 3 56.64	2.0689	7 40 35.6	12.767	8	15 49 1.19	2.3735	17 5 54.1	10.229
9	14 6 0.91	2.0736	7 53 21.0	12.746	9	15 52 23.82	2.3810	17 16 5.1	10.137
10	14 8 5.47	2.0785	8 6 5.1	12.723	10	15 54 46.91	2.3886	17 26 10.6	10.045
11	14 10 10.33	2.0835	8 18 47.8	12.699	11	15 57 10.45	2.3961	17 36 10.5	9.951
12	14 12 15.49	2.0885	8 31 29.0	12.674	12	15 59 34.44	2.4037	17 46 4.7	9.855
13	14 14 20.95	2.0936	8 44 8.7	12.649	13	16 1 58.89	2.4112	17 55 53.1	9.757
14	14 16 26.72	2.0988	8 56 46.9	12.623	14	16 4 23.79	2.4188	18 5 35.5	9.657
15	14 18 32.80	2.1040	9 9 23.5	12.595	15	16 6 49.15	2.4264	18 15 11.9	9.555
16	14 20 39.20	2.1094	9 21 58.3	12.565	16	16 9 14.96	2.4340	18 24 42.1	9.452
17	14 22 45.93	2.1148	9 34 31.3	12.534	17	16 11 41.23	2.4416	18 34 6.1	9.347
18	14 24 52.98	2.1203	9 47 2.4	12.509	18	16 14 7.95	2.4492	18 43 23.8	9.241
19	14 27 0.36	2.1258	9 59 31.6	12.480	19	16 16 35.13	2.4567	18 52 35.0	9.132
20	14 29 8.06	2.1315	10 11 58.7	12.434	20	16 19 2.76	2.4642	19 1 39.6	9.021
21	14 31 16.14	2.1379	10 24 23.7	12.399	21	16 21 30.84	2.4718	19 10 37.5	8.906
22	14 33 24.54	2.1446	10 36 46.6	12.362	22	16 23 59.38	2.4794	19 19 28.6	8.795
23	14 35 33.29	2.1497	10 49 7.2	12.323	23	16 26 28.37	2.4869	19 28 12.9	8.680
24	14 37 42.38	2.1545	S. 11 1 25.4	12.283	24	16 28 57.81	2.4944	S. 19 36 50.2	8.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
0	16 28 57.81	2.4944	S. 19° 36' 50.2	8.562	0	18 36 4.73	2.7600	S. 23° 41' 11.8	1.088
1	16 31 27.70	2.5019	19 45 20.4	8.449	1	18 38 50.40	2.7692	23 42 11.6	0.906
2	16 33 58.04	2.5093	19 53 43.3	8.321	2	18 41 36.19	2.7642	23 43 0.4	0.791
3	16 36 28.82	2.5167	20 1 58.9	8.198	3	18 44 22.10	2.7681	23 43 38.1	0.536
4	16 39 0.05	2.5241	20 10 7.1	8.074	4	18 47 8.12	2.7677	23 44 4.7	0.361
5	16 41 31.72	2.5314	20 18 7.8	7.948	5	18 49 54.23	2.7692	23 44 20.2	- 0.166
6	16 44 3.82	2.5387	20 26 0.9	7.820	6	18 52 40.42	2.7704	23 44 24.6	+ 0.019
7	16 46 36.26	2.5460	20 33 46.2	7.690	7	18 55 26.68	2.7716	23 44 17.9	0.904
8	16 49 9.34	2.5532	20 41 23.7	7.558	8	18 58 13.01	2.7726	23 44 0.1	0.389
9	16 51 42.75	2.5603	20 48 53.2	7.424	9	19 0 59.39	2.7733	23 43 31.2	0.575
10	16 54 16.58	2.5674	20 56 14.6	7.289	10	19 3 45.81	2.7738	23 42 51.1	0.761
11	16 56 50.84	2.5745	21 3 27.9	7.153	11	19 6 32.25	2.7742	23 41 59.8	0.947
12	16 59 25.52	2.5815	21 10 33.0	7.015	12	19 9 18.71	2.7743	23 40 57.4	1.133
13	17 2 0.62	2.5884	21 17 20.7	6.874	13	19 12 5.17	2.7743	23 39 43.8	1.319
14	17 4 36.13	2.5952	21 24 17.9	6.739	14	19 14 51.63	2.7749	23 38 19.1	1.505
15	17 7 12.04	2.6019	21 30 57.6	6.599	15	19 17 38.07	2.7738	23 36 43.2	1.691
16	17 9 48.36	2.6086	21 37 28.6	6.444	16	19 20 24.48	2.7732	23 34 56.2	1.876
17	17 12 25.08	2.6153	21 43 50.9	6.297	17	19 23 10.85	2.7725	23 32 58.1	2.061
18	17 15 2.19	2.6218	21 50 4.3	6.149	18	19 25 57.18	2.7716	23 30 48.9	2.246
19	17 17 39.69	2.6281	21 56 8.8	5.999	19	19 28 43.44	2.7704	23 28 28.6	2.431
20	17 20 17.57	2.6344	22 2 4.2	5.848	20	19 31 29.63	2.7691	23 25 57.2	2.615
21	17 22 55.82	2.6407	22 7 50.5	5.695	21	19 34 15.73	2.7676	23 23 14.8	2.798
22	17 25 34.45	2.6469	22 13 27.6	5.540	22	19 37 1.74	2.7659	23 20 21.4	2.981
23	17 28 13.45	2.6530	S. 22 18 55.3	5.383	23	19 39 47.64	2.7640	S. 23 17 17.1	3.163
SATURDAY 18.					MONDAY 20.				
0	17 30 52.81	2.6589	S. 22 24 13.6	5.226	0	19 42 33.42	2.7600	S. 23 14 1.9	3.344
1	17 33 32.52	2.6647	22 29 22.4	5.067	1	19 45 19.08	2.7596	23 10 35.8	3.526
2	17 36 12.57	2.6703	22 34 21.7	4.907	2	19 48 4.60	2.7574	23 6 58.8	3.707
3	17 38 52.96	2.6759	22 39 11.3	4.746	3	19 50 49.97	2.7548	23 3 11.0	3.886
4	17 41 33.68	2.6814	22 43 51.2	4.582	4	19 53 35.18	2.7521	22 59 12.5	4.065
5	17 44 14.73	2.6867	22 48 21.2	4.417	5	19 56 20.23	2.7493	22 55 3.2	4.243
6	17 46 56.09	2.6919	22 52 41.3	4.252	6	19 59 5.10	2.7463	22 50 43.3	4.420
7	17 49 37.76	2.6970	22 56 51.4	4.085	7	20 1 49.78	2.7431	22 46 12.8	4.596
8	17 52 19.73	2.7019	23 0 51.5	3.917	8	20 4 34.27	2.7397	22 41 31.8	4.771
9	17 55 1.99	2.7067	23 4 41.4	3.747	9	20 7 18.55	2.7362	22 36 40.3	4.945
10	17 57 44.53	2.7113	23 8 21.1	3.577	10	20 10 2.61	2.7325	22 31 38.4	5.118
11	18 0 27.35	2.7158	23 11 50.6	3.405	11	20 12 46.45	2.7287	22 26 26.1	5.290
12	18 3 10.43	2.7202	23 15 9.7	3.232	12	20 15 30.06	2.7247	22 21 3.6	5.460
13	18 5 53.77	2.7244	23 18 18.4	3.058	13	20 18 13.42	2.7206	22 15 30.9	5.630
14	18 8 37.36	2.7284	23 21 16.7	2.883	14	20 20 56.53	2.7163	22 9 48.0	5.799
15	18 11 21.18	2.7322	23 24 4.4	2.707	15	20 23 39.38	2.7119	22 3 55.0	5.966
16	18 14 5.23	2.7360	23 26 41.5	2.530	16	20 26 21.96	2.7074	21 57 52.1	6.131
17	18 16 49.50	2.7397	23 29 8.0	2.353	17	20 29 4.27	2.7027	21 51 39.3	6.296
18	18 19 33.99	2.7431	23 31 23.9	2.175	18	20 31 46.29	2.6979	21 45 16.6	6.459
19	18 22 18.68	2.7463	23 33 29.0	1.995	19	20 34 28.02	2.6930	21 38 44.2	6.620
20	18 25 3.55	2.7493	23 35 23.3	1.815	20	20 37 9.45	2.6879	21 32 2.2	6.780
21	18 27 48.60	2.7522	23 37 6.8	1.634	21	20 39 50.57	2.6827	21 25 10.6	6.939
22	18 30 33.82	2.7550	23 38 30.1	1.452	22	20 42 31.37	2.6774	21 18 9.5	7.096
23	18 33 19.20	2.7575	23 40 1.1	1.270	23	20 45 11.86	2.6721	21 10 59.1	7.251
24	18 36 4.73	2.7600	S. 23 41 11.8	1.088	24	20 47 52.02	2.6666	S. 21 3 39.4	7.405

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 21.					THURSDAY 23.				
0	^h 20 ^m 47 ^s 52.02	2.6006	S. 21° 3' 39.4	7.405	0	^h 22 ^m 48 ^s 17.59	2.3425	S. 12° 45' 25.4	12.614
1	20 50 31.85	2.6010	20 56 10.5	7.557	1	22 50 37.94	2.3358	12 32 46.7	12.675
2	20 53 11.34	2.6559	20 48 32.5	7.708	2	22 52 57.89	2.3299	12 20 4.4	12.735
3	20 55 50.48	2.6493	20 40 45.5	7.857	3	22 55 17.44	2.3235	12 7 18.5	12.793
4	20 58 29.26	2.6433	20 32 49.6	8.005	4	22 57 36.59	2.3159	11 54 29.2	12.849
5	21 1 7.68	2.6373	20 24 44.9	8.150	5	22 59 55.35	2.3093	11 41 36.6	12.909
6	21 3 45.74	2.6312	20 16 31.6	8.293	6	23 2 13.71	2.3026	11 28 40.9	12.954
7	21 6 23.43	2.6251	20 8 9 7	8.436	7	23 4 31.69	2.2964	11 15 42.1	13.005
8	21 9 0.75	2.6186	19 59 39.3	8.577	8	23 6 49.28	2.2900	11 2 40.3	13.054
9	21 11 37.69	2.6125	19 51 0.5	8.715	9	23 9 6.49	2.2837	10 49 35.6	13.101
10	21 14 14.25	2.6062	19 42 13.5	8.852	10	23 11 23.32	2.2774	10 36 28.2	13.146
11	21 16 50.43	2.5997	19 33 18.3	8.987	11	23 13 39.78	2.2711	10 23 18.1	13.189
12	21 19 26.22	2.5932	19 24 15.1	9.119	12	23 15 55.86	2.2649	10 10 5.5	13.231
13	21 22 1.61	2.5865	19 15 4.0	9.250	13	23 18 11.57	2.2585	9 56 50.4	13.271
14	21 24 36.60	2.5798	19 5 45.1	9.380	14	23 20 26.92	2.2522	9 43 33.0	13.309
15	21 27 11.19	2.5731	18 56 18.4	9.508	15	23 22 41.91	2.2458	9 30 13.3	13.346
16	21 29 45.38	2.5664	18 46 44.1	9.633	16	23 24 56.54	2.2403	9 16 51.5	13.381
17	21 32 19.16	2.5596	18 37 2.4	9.756	17	23 27 10.81	2.2349	9 3 27.6	13.415
18	21 34 52.53	2.5527	18 27 13.4	9.877	18	23 29 24.73	2.2291	8 50 1.7	13.447
19	21 37 25.49	2.5458	18 17 17.1	9.997	19	23 31 38.31	2.2234	8 36 34.0	13.477
20	21 39 58.03	2.5389	18 7 13.7	10.116	20	23 33 51.54	2.2177	8 23 4.5	13.505
21	21 42 30.16	2.5320	17 57 3.2	10.233	21	23 36 4.43	2.2121	8 9 33.4	13.533
22	21 45 1.87	2.5250	17 46 45.8	10.348	22	23 38 16.99	2.2065	7 56 0.7	13.558
23	21 47 33.16	2.5179	S. 17 36 21.7	10.457	23	23 40 29.22	2.2010	S. 7 42 26.5	13.583
WEDNESDAY 22.					FRIDAY 24.				
0	21 50 4.02	2.5108	S. 17 25 51.0	10.567	0	23 42 41.11	2.1955	S. 7 28 50.8	13.606
1	21 52 34.46	2.5038	17 15 13.7	10.675	1	23 44 52.68	2.1909	7 15 13.8	13.626
2	21 55 4.48	2.4968	17 4 30.0	10.781	2	23 47 3.94	2.1850	7 1 35.7	13.644
3	21 57 34.06	2.4897	16 53 40.0	10.885	3	23 49 14.88	2.1796	6 47 56.5	13.662
4	22 0 3.25	2.4826	16 42 43.8	10.987	4	23 51 25.51	2.1746	6 34 16.3	13.678
5	22 2 31.99	2.4755	16 31 41.6	11.087	5	23 53 35.83	2.1695	6 20 35.1	13.694
6	22 5 0.31	2.4684	16 20 33.4	11.185	6	23 55 45.85	2.1645	6 6 53.0	13.707
7	22 7 28.20	2.4613	16 9 19.4	11.281	7	23 57 55.57	2.1596	5 53 10.2	13.719
8	22 9 55.66	2.4542	15 57 59.7	11.375	8	0 0 5.00	2.1547	5 39 26.7	13.731
9	22 12 22.70	2.4471	15 46 34.4	11.467	9	0 2 14.14	2.1499	5 25 42.5	13.741
10	22 14 49.31	2.4399	15 35 3.7	11.557	10	0 4 22.99	2.1458	5 11 57.8	13.748
11	22 17 15.49	2.4328	15 23 27.6	11.645	11	0 6 31.57	2.1406	4 58 12.7	13.754
12	22 19 41.25	2.4257	15 11 46.3	11.731	12	0 8 39.87	2.1360	4 44 27.3	13.759
13	22 22 6.58	2.4187	14 59 59.9	11.815	13	0 10 47.89	2.1315	4 30 41.6	13.764
14	22 24 31.49	2.4117	14 48 8.5	11.897	14	0 12 55.65	2.1272	4 16 55.6	13.767
15	22 26 55.96	2.4046	14 36 12.2	11.977	15	0 15 3.15	2.1228	4 3 9.5	13.768
16	22 29 20.04	2.3976	14 24 11.2	12.056	16	0 17 10.39	2.1185	3 49 23.4	13.768
17	22 31 43.69	2.3907	14 12 5.5	12.132	17	0 19 17.37	2.1142	3 35 37.3	13.767
18	22 34 6.92	2.3837	13 59 55.3	12.207	18	0 21 24.10	2.1101	3 21 51.3	13.765
19	22 36 29.73	2.3767	13 47 40.7	12.279	19	0 23 30.58	2.1060	3 8 5.5	13.761
20	22 38 52.13	2.3696	13 35 21.8	12.350	20	0 25 36.82	2.1021	2 54 20.0	13.757
21	22 41 14.11	2.3626	13 22 58.7	12.419	21	0 27 42.83	2.0982	2 40 34.7	13.752
22	22 43 35.68	2.3561	13 10 31.5	12.486	22	0 29 48.61	2.0944	2 26 49.8	13.744
23	22 45 56.81	2.3493	12 58 0.4	12.551	23	0 31 54.16	2.0907	2 13 5.4	13.735
24	22 48 17.59	2.3425	S. 12 45 25.4	12.614	24	0 33 59.49	2.0870	S. 1 59 21.6	13.725

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
0	0 33 59.49	2.0870	S. 1° 59' 21.6"	13.725	0	2 11 17.98	1.9940	N. 8° 29' 14.0"	12.196
1	0 36 4.60	2.0833	1 45 38.4	13.715	1	2 13 17.61	1.9936	8 41 20.0	12.072
2	0 38 9.49	2.0797	1 31 55.8	13.703	2	2 15 17.22	1.9933	8 53 22.7	12.018
3	0 40 14.17	2.0763	1 18 14.0	13.690	3	2 17 16.81	1.9931	9 5 22.2	11.964
4	0 42 18.65	2.0730	1 4 33.0	13.676	4	2 19 16.39	1.9930	9 17 18.4	11.908
5	0 44 22.93	2.0697	0 50 52.9	13.660	5	2 21 15.97	1.9929	9 29 11.2	11.852
6	0 46 27.01	2.0664	0 37 13.8	13.644	6	2 23 15.54	1.9928	9 41 0.7	11.796
7	0 48 30.90	2.0632	0 23 35.7	13.627	7	2 25 15.11	1.9928	9 52 46.8	11.739
8	0 50 34.60	2.0602	S. 0 9 58.6	13.609	8	2 27 14.68	1.9929	10 4 29.4	11.681
9	0 52 38.12	2.0572	N. 0 3 37.4	13.590	9	2 29 14.26	1.9930	10 16 8.5	11.622
10	0 54 41.46	2.0543	0 17 12.2	13.569	10	2 31 13.84	1.9933	10 27 44.0	11.569
11	0 56 44.63	2.0513	0 30 45.7	13.547	11	2 33 13.44	1.9934	10 39 15.9	11.509
12	0 58 47.62	2.0485	0 44 17.9	13.525	12	2 35 13.05	1.9937	10 50 44.2	11.441
13	1 0 50.45	2.0458	0 57 48.7	13.502	13	2 37 12.68	1.9940	11 2 8.8	11.380
14	1 2 53.12	2.0432	1 11 18.1	13.477	14	2 39 12.33	1.9943	11 13 29.8	11.319
15	1 4 55.63	2.0406	1 24 46.0	13.452	15	2 41 12.00	1.9947	11 24 47.1	11.256
16	1 6 57.99	2.0381	1 38 12.3	13.425	16	2 43 11.70	1.9952	11 36 0.6	11.192
17	1 9 0.20	2.0357	1 51 37.0	13.397	17	2 45 11.43	1.9957	11 47 10.2	11.128
18	1 11 2.27	2.0333	2 5 0.0	13.369	18	2 47 11.18	1.9962	11 58 16.0	11.064
19	1 13 4.20	2.0311	2 18 21.3	13.340	19	2 49 10.97	1.9969	12 9 17.9	10.999
20	1 15 6.00	2.0289	2 31 40.8	13.310	20	2 51 10.80	1.9976	12 20 15.9	10.933
21	1 17 7.66	2.0267	2 44 58.5	13.279	21	2 53 10.68	1.9983	12 31 9.9	10.867
22	1 19 9.20	2.0246	2 58 14.3	13.247	22	2 55 10.60	1.9990	12 41 59.9	10.800
23	1 21 10.61	2.0225	N. 3 11 28.1	13.214	23	2 57 10.56	1.9997	N. 12 52 45.9	10.732
SUNDAY 26.					TUESDAY 28.				
0	1 23 11.90	2.0206	N. 3 24 39.9	13.180	0	2 59 10.57	2.0006	N. 13 3 27.8	10.664
1	1 25 13.08	2.0188	3 37 49.7	13.146	1	3 1 10.63	2.0015	13 14 5.6	10.596
2	1 27 14.15	2.0170	3 50 57.4	13.110	2	3 3 10.75	2.0024	13 24 39.3	10.527
3	1 29 15.12	2.0153	4 4 2.9	13.073	3	3 5 10.92	2.0033	13 35 8.8	10.456
4	1 31 15.98	2.0136	4 17 6.2	13.036	4	3 7 11.15	2.0043	13 45 34.0	10.384
5	1 33 16.75	2.0120	4 30 7.2	12.998	5	3 9 11.44	2.0054	13 55 54.9	10.313
6	1 35 17.42	2.0104	4 43 5.9	12.959	6	3 11 11.80	2.0065	14 6 11.6	10.242
7	1 37 18.00	2.0090	4 56 2.3	12.920	7	3 13 12.22	2.0076	14 16 24.0	10.170
8	1 39 18.50	2.0077	5 8 56.3	12.879	8	3 15 12.71	2.0087	14 26 32.0	10.097
9	1 41 18.92	2.0063	5 21 47.8	12.837	9	3 17 13.27	2.0099	14 36 35.6	10.023
10	1 43 19.26	2.0050	5 34 36.8	12.795	10	3 19 13.90	2.0111	14 46 34.8	9.949
11	1 45 19.52	2.0038	5 47 23.2	12.752	11	3 21 14.60	2.0123	14 56 29.5	9.874
12	1 47 19.71	2.0027	6 0 7.1	12.709	12	3 23 15.38	2.0136	15 6 19.7	9.799
13	1 49 19.84	2.0017	6 12 48.3	12.664	13	3 25 16.24	2.0150	15 16 5.4	9.723
14	1 51 19.91	2.0007	6 25 26.8	12.619	14	3 27 17.18	2.0163	15 25 46.5	9.647
15	1 53 19.92	1.9997	6 38 2.6	12.573	15	3 29 18.20	2.0177	15 35 23.0	9.570
16	1 55 19.88	1.9988	6 50 35.6	12.526	16	3 31 19.31	2.0192	15 44 54.9	9.492
17	1 57 19.78	1.9979	7 3 5.7	12.479	17	3 33 20.50	2.0206	15 54 22.1	9.414
18	1 59 19.63	1.9972	7 15 33.0	12.431	18	3 35 21.78	2.0221	16 3 44.6	9.336
19	2 1 19.44	1.9965	7 27 57.4	12.382	19	3 37 23.15	2.0236	16 13 2.4	9.257
20	2 3 19.21	1.9959	7 40 18.8	12.333	20	3 39 24.61	2.0251	16 22 15.4	9.177
21	2 5 18.95	1.9953	7 52 37.2	12.281	21	3 41 26.16	2.0267	16 31 23.6	9.096
22	2 7 18.65	1.9948	8 4 52.5	12.230	22	3 43 27.81	2.0282	16 40 26.9	9.015
23	2 9 18.33	1.9944	8 17 4.8	12.179	23	3 45 29.55	2.0298	16 49 25.4	8.934
24	2 11 17.98	1.9940	N. 8 29 14.0	12.126	24	3 47 31.39	2.0315	N. 16 58 19.0	8.852

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.																
WEDNESDAY 29.					FRIDAY 31.																				
0	3 ^h 47 ^m 31.39 ^s	2.0315	N.16° 58' 19.0"	8.852	0	5 ^h 27 ^m 7.16 ^s	2.1179	N.22° 19' 0.3"	4.330																
1	3 49 33.33	2.0332	17 7 7.7	8.770	1	5 29 14.28	2.1194	22 23 17.0	4.299																
2	3 51 35.37	2.0348	17 15 51.4	8.687	2	5 31 21.49	2.1210	22 27 27.4	4.190																
3	3 53 37.50	2.0364	17 24 30.1	8.602	3	5 33 28.80	2.1226	22 31 31.4	4.014																
4	3 55 39.74	2.0381	17 33 3.7	8.517	4	5 35 36.20	2.1240	22 35 29.1	3.909																
5	3 57 42.08	2.0399	17 41 32.2	8.432	5	5 37 43.68	2.1254	22 39 20.5	3.803																
6	3 59 44.53	2.0417	17 49 55.6	8.347	6	5 39 51.25	2.1269	22 43 5.5	3.697																
7	4 1 47.08	2.0434	17 58 13.9	8.262	7	5 41 58.91	2.1283	22 46 44.1	3.590																
8	4 3 49.74	2.0452	18 6 27.1	8.177	8	5 44 6.65	2.1297	22 50 16.3	3.483																
9	4 5 52.51	2.0471	18 14 35.1	8.090	9	5 46 14.47	2.1310	22 53 42.0	3.375																
10	4 7 55.39	2.0488	18 22 37.9	8.002	10	5 48 22.37	2.1323	22 57 1.3	3.268																
11	4 9 58.37	2.0506	18 30 35.4	7.914	11	5 50 30.35	2.1336	23 0 14.2	3.161																
12	4 12 1.46	2.0524	18 38 27.6	7.826	12	5 52 38.40	2.1348	23 3 20.6	3.053																
13	4 14 4.66	2.0543	18 46 14.5	7.737	13	5 54 46.53	2.1361	23 6 20.5	2.944																
14	4 16 7.98	2.0562	18 53 56.1	7.648	14	5 56 54.73	2.1372	23 9 13.9	2.835																
15	4 18 11.41	2.0581	19 1 32.3	7.558	15	5 59 2.99	2.1382	23 12 0.7	2.726																
16	4 20 14.95	2.0599	19 9 3.1	7.467	16	6 1 11.32	2.1393	23 14 41.0	2.617																
17	4 22 18.60	2.0618	19 16 28.4	7.376	17	6 3 19.71	2.1404	23 17 14.7	2.507																
18	4 24 22.36	2.0637	19 23 48.2	7.284	18	6 5 28.17	2.1414	23 19 41.9	2.398																
19	4 26 26.24	2.0656	19 31 2.5	7.193	19	6 7 36.68	2.1423	23 22 2.5	2.288																
20	4 28 30.23	2.0674	19 38 11.3	7.101	20	6 9 45.25	2.1433	23 24 16.5	2.178																
21	4 30 34.33	2.0693	19 45 14.6	7.008	21	6 11 53.88	2.1442	23 26 23.9	2.067																
22	4 32 38.55	2.0712	19 52 12.3	6.914	22	6 14 2.56	2.1451	23 28 24.6	1.957																
23	4 34 42.88	2.0731	N.19 59 4.3	6.820	23	6 16 11.29	2.1459	N.23 30 18.7	1.847																
THURSDAY 30.					SATURDAY, FEBRUARY 1.																				
0	4 36 47.32	2.0750	N.20 5 50.7	6.726	0	6 18 20.06	2.1466	N.23 32 6.2	1.736																
1	4 38 51.88	2.0769	20 12 31.4	6.631	PHASES OF THE MOON.																				
2	4 40 56.55	2.0788	20 19 6.4	6.536																					
3	4 43 1.34	2.0807	20 25 35.7	6.440																					
4	4 45 6.24	2.0826	20 31 59.2	6.344																					
5	4 47 11.25	2.0845	20 38 17.0	6.248	<table><tr><td>○ Full Moon . . . Jan.</td><td>d</td><td>h</td><td>m</td></tr><tr><td>☾ Last Quarter</td><td>13</td><td>18</td><td>32.7</td></tr><tr><td>● New Moon</td><td>20</td><td>11</td><td>49.0</td></tr><tr><td>☽ First Quarter</td><td>27</td><td>8</td><td>16.4</td></tr></table>					○ Full Moon . . . Jan.	d	h	m	☾ Last Quarter	13	18	32.7	● New Moon	20	11	49.0	☽ First Quarter	27	8	16.4
○ Full Moon . . . Jan.	d	h	m																						
☾ Last Quarter	13	18	32.7																						
● New Moon	20	11	49.0																						
☽ First Quarter	27	8	16.4																						
6	4 49 16.38	2.0864	20 44 29.0	6.151																					
7	4 51 21.62	2.0882	20 50 35.1	6.053																					
8	4 53 26.97	2.0901	20 56 35.3	5.954																					
9	4 55 32.43	2.0919	21 2 29.6	5.856																					
10	4 57 38.00	2.0937	21 8 18.0	5.757																					
11	4 59 43.68	2.0956	21 14 0.5	5.658																					
12	5 1 49.47	2.0974	21 19 37.0	5.558																					
13	5 3 55.37	2.0992	21 25 7.5	5.458																					
14	5 6 1.38	2.1010	21 30 32.0	5.357																					
15	5 8 7.49	2.1028	21 35 50.4	5.257																					
16	5 10 13.71	2.1046	21 41 2.8	5.156																					
17	5 12 20.04	2.1063	21 46 9.1	5.054																					
18	5 14 26.47	2.1080	21 51 9.2	4.951																					
19	5 16 33.00	2.1097	21 56 3.2	4.849																					
20	5 18 39.63	2.1114	22 0 51.1	4.746																					
21	5 20 46.37	2.1131	22 5 32.8	4.642																					
22	5 22 53.20	2.1147	22 10 8.2	4.538																					
23	5 25 0.13	2.1163	22 14 37.4	4.434																					
24	5 27 7.16	2.1179	N.22 19 0.3	4.330	<table><tr><td>☾ Apogee Jan.</td><td>d</td><td>h</td></tr><tr><td>☾ Perigee</td><td>20</td><td>2.7</td></tr></table>					☾ Apogee Jan.	d	h	☾ Perigee	20	2.7										
☾ Apogee Jan.	d	h																							
☾ Perigee	20	2.7																							

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut W.	76 38 23	3118	78 6 10	3194	79 33 50	3130	81 1 23	3136
	α Pegasi W.	60 58 5	3476	62 18 56	3469	63 39 55	3461	65 1 2	3457
	Pollux E.	63 3 12	2947	61 31 53	2954	60 0 43	2963	58 29 44	2970
	Regulus E.	98 55 20	2936	97 23 46	2943	95 52 22	2951	94 21 8	2958
2	Fomalhaut W.	88 17 22	3165	89 44 13	3171	91 10 57	3177	92 37 34	3182
	α Pegasi W.	71 47 48	3441	73 9 18	3439	74 30 51	3438	75 52 24	3437
	α Arietis W.	28 20 16	3645	29 38 2	3591	30 56 46	3545	32 16 20	3506
	Pollux E.	50 57 15	3008	49 27 13	3016	47 57 20	3023	46 27 36	3030
	Regulus E.	86 47 10	2991	85 16 46	2997	83 46 30	3003	82 16 21	3008
	SATURN E.	92 6 56	2975	90 36 12	2981	89 5 35	2986	87 35 5	2991
3	Fomalhaut W.	99 48 56	3211	101 14 52	3217	102 40 40	3223	104 6 21	3229
	α Pegasi W.	82 40 11	3441	84 1 42	3442	85 23 11	3444	86 44 37	3446
	α Arietis W.	39 3 14	3377	40 25 57	3359	41 49 0	3344	42 12 20	3331
	Pollux E.	39 1 2	3064	37 32 8	3071	36 3 23	3078	34 34 47	3086
	Regulus E.	74 47 10	3039	73 17 37	3036	71 48 9	3040	70 18 46	3043
	SATURN E.	80 4 8	3014	78 34 13	3018	77 4 23	3022	75 34 37	3026
4	α Pegasi W.	93 31 3	3463	94 52 8	3468	96 13 8	3473	97 34 4	3478
	α Arietis W.	50 12 25	3289	51 36 57	3276	53 1 37	3269	54 26 25	3263
	Pollux E.	27 14 13	3132	25 46 42	3143	24 19 25	3156	22 52 23	3171
	Regulus E.	62 52 56	3060	61 23 58	3063	59 55 3	3066	58 26 12	3069
	SATURN E.	68 6 51	3041	66 37 29	3043	65 8 10	3046	63 38 54	3048
	Spica E.	116 49 31	3089	115 21 8	3090	113 52 46	3091	112 24 26	3092
5	α Pegasi W.	104 17 8	3508	105 37 23	3516	106 57 30	3524	108 17 27	3533
	α Arietis W.	61 31 56	3241	62 57 17	3237	64 22 42	3234	65 48 11	3231
	Aldebaran W.	29 32 51	3091	31 1 12	3089	32 29 35	3088	33 57 59	3087
	Regulus E.	51 2 40	3079	49 34 5	3082	48 5 33	3083	46 37 3	3085
	SATURN E.	56 13 10	3057	54 44 8	3058	53 15 7	3060	51 46 8	3061
	Spica E.	105 3 5	3097	103 34 52	3098	102 6 40	3099	100 38 30	3100
6	α Arietis W.	72 56 26	3218	74 22 14	3216	75 48 4	3214	77 13 57	3212
	Aldebaran W.	41 20 16	3083	42 48 46	3082	44 17 17	3082	45 45 49	3080
	Regulus E.	39 15 4	3094	37 46 46	3096	36 18 31	3097	34 50 18	3099
	SATURN E.	44 21 32	3064	42 52 39	3065	41 23 47	3066	39 54 56	3067
	Spica E.	93 17 43	3100	91 49 34	3100	90 21 25	3099	88 53 15	3099
	MARS E.	103 57 43	3264	102 33 13	3263	101 8 42	3263	99 44 11	3263
7	Aldebaran W.	53 8 53	3073	54 37 35	3072	56 6 19	3070	57 35 6	3068
	Regulus E.	27 29 51	3112	26 1 56	3117	24 34 7	3121	22 6 23	3128
	SATURN E.	32 30 49	3068	31 2 0	3069	29 33 12	3069	28 4 25	3070
	Spica E.	81 32 20	3096	80 4 6	3095	78 35 51	3094	77 7 34	3093
	MARS E.	92 41 21	3277	91 16 43	3275	89 52 3	3274	88 27 21	3272
8	Aldebaran W.	64 59 39	3056	66 28 43	3052	67 57 51	3049	69 27 3	3045
	Pollux W.	21 11 38	3167	22 38 26	3149	24 5 36	3135	25 33 3	3123
	Spica E.	69 45 44	3084	68 17 15	3089	66 48 44	3086	65 20 11	3078
	MARS E.	81 23 15	3280	79 58 17	3257	78 33 15	3254	77 8 10	3250
9	Aldebaran W.	76 54 13	3085	78 23 55	3080	79 53 43	3016	81 23 36	3010

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut W.	82° 28' 49"	3142	83° 56' 8"	3148	85° 23' 19"	3154	86° 50' 24"	3160
	α Pegasi W.	66 22 14	3452	67 43 32	3448	69 4 54	3445	70 26 19	3443
	Pollux E.	56 58 54	2978	55 28 14	2987	53 57 45	2995	52 27 26	3001
	Regulus E.	92 50 3	2965	91 19 7	2973	89 48 20	2979	88 17 41	2985
2	Fomalhaut W.	94 4 4	3187	95 30 28	3193	96 56 44	3199	98 22 54	3205
	α Pegasi W.	77 13 58	3437	78 35 32	3437	79 57 6	3438	81 18 39	3439
	α Arietis W.	33 36 37	3474	34 57 30	3444	36 18 57	3418	37 40 53	3398
	Pollux E.	44 58 1	3036	43 28 33	3043	41 59 14	3051	40 30 4	3057
	Regulus E.	80 46 18	3013	79 16 22	3018	77 46 32	3023	76 16 48	3028
	SATURN E.	86 4 41	2997	84 34 24	3001	83 4 13	3006	81 34 8	3010
3	Fomalhaut W.	105 31 55	3236	106 57 21	3242	108 22 40	3249	109 47 52	3256
	α Pegasi W.	88 6 1	3449	89 27 22	3452	90 48 39	3455	92 9 53	3459
	α Arietis W.	44 35 56	3318	45 59 46	3308	47 23 48	3299	48 48 1	3289
	Pollux E.	33 6 20	3093	31 38 2	3101	30 9 53	3111	28 41 57	3121
	Regulus E.	68 49 27	3047	67 20 13	3051	65 51 3	3054	64 21 57	3058
	SATURN E.	74 4 56	3029	72 35 19	3032	71 5 46	3035	69 36 17	3038
4	α Pegasi W.	98 54 53	3484	100 15 37	3490	101 36 14	3496	102 56 45	3502
	α Arietis W.	55 51 20	3258	57 16 21	3253	58 41 27	3248	60 6 39	3244
	Pollux E.	21 25 39	3189	19 59 17	3213	18 33 23	3241	17 8 3	3275
	Regulus E.	56 57 24	3071	55 28 39	3073	53 59 57	3075	52 31 17	3078
	SATURN E.	62 9 40	3050	60 40 29	3052	59 11 20	3054	57 42 14	3056
	Spica E.	110 56 8	3093	109 27 50	3094	107 59 34	3095	106 31 19	3096
5	α Pegasi W.	109 37 15	3542	110 56 52	3552	112 16 19	3562	113 35 34	3575
	α Arietis W.	67 13 44	3228	68 39 20	3225	70 4 59	3223	71 30 41	3220
	Aldebaran W.	35 26 25	3086	36 54 51	3086	38 23 18	3085	39 51 46	3083
	Regulus E.	45 8 35	3087	43 40 9	3088	42 11 45	3090	40 43 23	3092
	SATURN E.	50 17 11	3069	48 48 15	3063	47 19 20	3064	45 50 26	3064
	Spica E.	99 10 19	3100	97 42 10	3100	96 14 1	3100	94 45 51	3100
6	α Arietis W.	78 39 52	3210	80 5 50	3208	81 31 50	3205	82 57 53	3204
	Aldebaran W.	47 14 23	3079	48 42 58	3078	50 11 35	3077	51 40 13	3075
	Regulus E.	33 22 7	3101	31 53 58	3103	30 25 52	3106	28 57 50	3109
	SATURN E.	38 26 6	3067	36 57 16	3067	35 28 26	3068	33 59 37	3069
	Spica E.	87 25 6	3098	85 56 56	3098	84 28 41	3097	83 0 33	3097
	MARS E.	98 19 39	3282	96 55 6	3281	95 30 32	3280	94 5 57	3279
7	Aldebaran W.	59 3 55	3065	60 32 47	3064	62 1 41	3061	63 30 38	3058
	Regulus E.	21 38 47	3136	20 11 21	3145	18 44 6	3157	17 17 6	3177
	SATURN E.	26 35 39	3071	25 6 54	3073	23 38 11	3075	22 9 31	3079
	Spica E.	75 39 16	3091	74 10 56	3090	72 42 34	3088	71 14 10	3086
	MARS E.	87 2 37	3270	85 37 51	3268	84 13 2	3265	82 48 10	3263
8	Aldebaran W.	70 56 20	3042	72 25 41	3039	73 55 6	3034	75 24 37	3030
	Pollux W.	27 0 45	3111	28 28 41	3100	29 56 51	3090	31 25 13	3081
	Spica E.	63 51 34	3075	62 22 54	3079	60 54 11	3069	59 25 24	3066
	MARS E.	75 43 0	3247	74 17 46	3243	72 52 27	3238	71 27 3	3234
9	Aldebaran W.	82 53 36	3005	84 23 43	2998	85 53 58	2993	87 24 20	2986

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Pollux W.	32° 53' 46"	3071	34° 22' 31"	3063	35° 51' 26"	3054	37° 20' 32"	3046
	Spica E.	57 56 35	3063	56 27 41	3060	54 58 44	3037	53 29 43	3054
	MARS E.	70 1 34	3229	68 35 59	3294	67 10 19	3219	65 44 33	3213
	Antares E.	103 49 31	3050	102 20 20	3045	100 51 3	3039	99 21 38	3033
10	Aldebaran W.	88 54 50	2980	90 25 28	2973	91 56 15	2965	93 27 11	2958
	Pollux W.	44 48 33	3005	46 18 40	2997	47 48 57	2989	49 19 25	2979
	Spica E.	46 3 35	3037	44 34 9	3034	43 4 39	3031	41 35 4	3028
	MARS E.	58 33 57	3183	57 7 28	3176	55 40 50	3169	54 14 4	3161
	Antares E.	91 52 50	3002	90 22 40	2995	88 52 23	2988	87 21 56	2981
	SUN E.	133 22 28	3355	131 59 20	3348	130 36 4	3340	129 12 38	3333
11	Pollux W.	56 54 39	2931	58 26 17	2921	59 58 9	2911	61 30 14	2900
	Spica E.	34 6 25	3016	32 36 35	3019	31 6 46	3020	29 36 57	3022
	Antares E.	79 47 14	2940	78 15 46	2930	76 44 6	2920	75 12 14	2911
	SUN E.	122 13 0	3285	120 48 31	3275	119 23 50	3265	117 58 57	3253
12	Pollux W.	69 14 12	2949	70 47 45	2930	72 21 34	2917	73 55 39	2904
	Regulus W.	33 20 57	2956	34 54 12	2949	36 27 46	2937	38 1 39	2911
	SATURN W.	26 22 42	2932	29 56 29	2917	31 30 35	2902	33 5 0	2788
	Antares E.	67 29 45	2980	65 56 35	2949	64 23 9	2937	62 49 29	2925
	SUN E.	110 51 9	3193	109 24 51	3180	107 58 18	3167	106 31 29	3153
13	Pollux W.	81 50 30	2735	83 26 24	2720	85 2 37	2705	86 39 10	2689
	Regulus W.	45 55 55	2737	47 31 46	2722	49 7 57	2706	50 44 29	2690
	SATURN W.	41 1 51	2714	42 38 12	2698	44 14 54	2683	45 51 57	2667
	Antares E.	54 57 17	2764	53 22 2	2752	51 46 30	2739	50 10 42	2726
	SUN E.	99 13 3	3078	97 44 27	3063	96 15 32	3047	94 46 17	3030
14	Regulus W.	58 52 38	2907	60 31 23	2900	62 10 32	2879	63 50 5	2855
	SATURN W.	54 2 38	2905	55 41 54	2908	57 21 33	2950	59 1 36	2933
	Antares E.	42 7 25	2963	40 29 56	2951	38 52 11	2939	37 14 10	2929
	SUN E.	87 14 46	2943	85 43 22	2926	84 11 36	2908	82 39 27	2889
15	Regulus W.	72 13 53	2406	73 55 54	2448	75 38 20	2431	77 21 11	2413
	SATURN W.	67 27 56	2445	69 10 27	2427	70 53 23	2409	72 36 45	2391
	Spica W.	19 14 6	2746	20 49 45	2691	22 26 37	2640	24 4 37	2583
	SUN E.	74 52 41	2794	73 18 6	2776	71 43 7	2756	70 7 42	2737
16	Regulus W.	86 1 53	2323	87 47 19	2305	89 33 11	2288	91 19 28	2270
	SATURN W.	81 20 3	2301	83 6 1	2284	84 52 24	2266	86 39 13	2249
	Spica W.	32 28 32	2422	34 11 35	2395	35 55 16	2370	37 39 33	2345
	SUN E.	62 4 17	2642	60 26 19	2623	58 47 56	2605	57 9 8	2587
17	Regulus W.	100 17 9	2186	102 5 54	2172	103 55 3	2158	105 44 34	2143
	Spica W.	46 29 24	2238	48 16 54	2219	50 4 52	2202	51 53 18	2184
	MARS W.	29 30 53	2264	31 15 20	2246	33 0 14	2228	34 45 33	2211
	SUN E.	48 48 56	2499	47 7 42	2489	45 26 4	2467	43 44 5	2452
18	Spica W.	61 1 40	2107	62 52 28	2093	64 43 37	2080	66 35 6	2069
	MARS W.	43 38 3	2235	45 25 38	2222	47 13 32	2210	49 1 45	2196
	SUN E.	35 8 56	2394	33 24 58	2372	31 40 43	2352	29 56 13	2329

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Pollux W.	38° 49' 48"	3038	40° 19' 14"	3030	41° 48' 50"	3022	42° 18' 36"	3013
	Spica E.	52 0 38	3050	50 31 28	3047	49 2 15	3044	47 32 57	3040
	Mars E.	64 18 39	3008	62 52 39	3003	61 26 33	3196	60 0 19	3189
	Antares E.	97 52 7	3028	96 22 29	3022	94 52 44	3015	93 22 51	3009
10	Aldebaran W.	94 58 16	2950	96 29 31	2942	98 0 56	2933	99 32 33	2925
	Pollux W.	50 50 4	2969	52 20 56	2961	53 51 58	2951	55 23 12	2941
	Spica E.	40 5 27	3025	38 35 45	3023	37 6 1	3021	35 36 14	3019
	Mars E.	52 47 8	3153	51 20 3	3144	49 52 47	3136	48 25 21	3127
	Antares E.	85 51 19	2973	84 20 33	2965	82 49 37	2957	81 18 31	2949
	Sun E.	127 49 3	3323	126 25 18	3314	125 1 23	3305	123 37 17	3295
11	Pollux W.	63 2 33	2989	64 35 6	2978	66 7 53	2966	67 40 55	2955
	Spica E.	28 7 12	3029	26 37 36	3035	25 8 7	3044	23 38 49	3050
	Antares E.	73 40 10	2902	72 7 54	2892	70 35 24	2882	69 2 42	2871
	Sun E.	116 33 51	3242	115 8 32	3230	113 42 59	3218	112 17 11	3206
12	Pollux W.	75 30 2	2790	77 4 43	2777	78 39 41	2764	80 14 56	2750
	Regulus W.	39 35 52	2798	41 10 23	2782	42 45 14	2766	44 20 24	2750
	Saturn W.	34 39 43	2773	36 14 46	2759	37 50 8	2744	39 25 50	2729
	Antares E.	61 15 35	2813	59 41 24	2801	58 6 58	2788	56 32 15	2776
	Sun E.	105 4 23	3138	103 37 0	3124	102 9 19	3109	100 41 20	3094
13	Pollux W.	88 16 4	2673	89 53 20	2658	91 30 56	2643	93 8 53	2628
	Regulus W.	52 21 23	2674	53 58 38	2657	55 36 16	2640	57 14 16	2624
	Saturn W.	47 29 21	2651	49 7 7	2634	50 45 15	2618	52 23 45	2601
	Antares E.	48 34 36	2713	46 58 14	2701	45 21 35	2688	43 44 39	2675
	Sun E.	93 16 41	3013	91 46 45	2996	90 16 27	2978	88 45 47	2961
14	Regulus W.	65 30 1	2537	67 10 22	2520	68 51 8	2502	70 32 18	2484
	Saturn W.	60 42 3	2516	62 22 54	2498	64 4 10	2481	65 45 50	2469
	Antares E.	35 35 55	2619	33 57 26	2610	32 18 45	2603	30 39 54	2598
	Sun E.	81 6 54	2670	79 33 57	2651	78 0 36	2631	76 26 51	2613
15	Regulus W.	79 4 28	2394	80 48 11	2377	82 32 19	2359	84 16 53	2341
	Saturn W.	74 20 33	2373	76 4 46	2355	77 49 26	2337	79 34 31	2319
	Spica W.	25 43 41	2551	27 23 43	2515	29 4 35	2483	30 46 12	2452
	Sun E.	68 31 52	2718	66 55 36	2699	65 18 55	2681	63 41 49	2661
16	Regulus W.	93 6 11	2253	94 53 19	2237	96 40 51	2220	98 28 48	2204
	Saturn W.	88 26 27	2232	90 14 7	2215	92 2 12	2199	93 50 41	2182
	Spica W.	39 24 26	2322	41 9 53	2299	42 55 53	2279	44 42 23	2258
	Sun E.	55 29 55	2560	53 50 17	2551	52 10 14	2533	50 29 47	2516
17	Regulus W.	107 34 27	2128	109 24 43	2115	111 15 19	2102	113 6 15	2090
	Spica W.	53 42 10	2167	55 31 27	2150	57 21 8	2135	59 11 13	2121
	Mars W.	36 31 17	2294	38 17 25	2278	40 3 56	2264	41 50 49	2249
	Sun E.	42 1 44	2436	40 19 1	2422	38 35 58	2409	36 52 36	2396
18	Spica W.	68 26 52	2058	70 18 55	2048	72 11 14	2039	74 3 47	2030
	Mars W.	50 50 15	2186	52 39 1	2177	54 28 3	2168	56 17 19	2158
	Sun E.	28 11 30	2344	26 26 34	2335	24 41 26	2326	22 56 10	2315

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Sun	W.	21° 40' 22"	9384	23° 24' 20"	9394	25° 8' 3"	9406	26° 51' 29"	9417
	α Arietis	E.	73 23 14	9903	71 34 51	9918	69 46 51	9935	67 59 16	9959
	Aldebaran	E.	103 57 32	9080	102 5 31	9071	100 13 48	9084	98 22 24	9098
23	Sun	W.	35 24 5	9491	37 5 32	9507	38 46 36	9523	40 27 17	9541
	α Arietis	E.	59 8 15	9356	57 23 37	9380	55 39 33	9405	53 56 6	9439
	Aldebaran	E.	89 10 48	9171	87 21 37	9188	85 32 51	9204	83 44 30	9222
24	Sun	W.	48 44 22	9835	50 22 29	9855	52 0 9	9875	53 37 22	9885
	α Arietis	E.	45 29 0	9590	43 49 51	9628	42 11 34	9667	40 34 10	9711
	Aldebaran	E.	74 49 17	9311	73 3 34	9330	71 18 19	9349	69 33 31	9368
25	Sun	W.	61 36 43	9797	63 11 14	9818	64 45 18	9838	66 18 56	9858
	Aldebaran	E.	60 56 30	9465	59 14 27	9484	57 32 51	9504	55 51 42	9522
26	Sun	W.	74 0 37	9959	75 31 41	9978	77 2 21	9997	78 32 37	3017
	Fomalhaut	W.	49 24 38	9830	50 56 19	9831	52 27 58	9836	53 59 31	9843
	Aldebaran	E.	47 32 44	9619	45 54 15	9638	44 16 11	9657	42 38 33	9675
	Pollux	E.	91 45 55	9621	90 7 29	9640	88 29 28	9657	86 51 50	9674
27	Sun	W.	85 58 9	3107	87 26 10	3125	88 53 49	3142	90 21 8	3158
	Fomalhaut	W.	61 35 10	2980	63 5 49	2999	64 36 15	2998	66 6 30	3008
	α Pegasi	W.	47 21 10	3555	48 40 34	3539	50 0 23	3511	51 20 35	3495
	Aldebaran	E.	34 36 28	2768	33 1 15	2783	31 26 25	2801	29 51 59	2819
	Pollux	E.	78 49 29	2759	77 14 7	2775	75 39 6	2790	74 4 25	2806
28	Sun	W.	97 32 58	3234	98 58 27	3248	100 23 39	3262	101 48 35	3276
	Fomalhaut	W.	73 34 40	3058	75 3 40	3068	76 32 29	3077	78 1 6	3087
	α Pegasi	W.	58 5 25	3443	59 26 53	3436	60 48 29	3439	62 10 9	3438
	Pollux	E.	66 15 54	2877	64 43 6	2890	63 10 34	2903	61 38 19	2916
29	Sun	W.	108 49 32	3335	110 13 3	3345	111 36 22	3355	112 59 29	3365
	Fomalhaut	W.	85 21 13	3135	86 48 40	3143	88 15 56	3151	89 43 2	3160
	α Pegasi	W.	68 59 10	3423	70 21 0	3423	71 42 50	3425	73 4 38	3426
	α Arietis	W.	25 42 7	3753	26 57 58	3684	28 15 2	3695	29 33 9	3578
	Pollux	E.	54 1 3	2975	52 30 19	2985	50 59 48	2995	49 29 29	3005
	Regulus	E.	89 52 40	2959	88 21 36	2969	86 50 44	2978	85 20 3	2987
	SATURN	E.	93 44 8	2928	92 12 25	2940	90 40 57	2950	89 9 42	2957
30	Sun	W.	119 52 25	3408	121 14 32	3416	122 36 31	3423	123 58 22	3439
	Fomalhaut	W.	96 55 57	3202	98 22 3	3210	99 48 0	3218	101 13 47	3226
	α Pegasi	W.	79 53 9	3437	81 14 43	3440	82 36 14	3443	83 57 41	3446
	α Arietis	W.	36 15 3	3415	37 37 2	3395	38 59 24	3378	40 22 5	3363
	Pollux	E.	42 0 56	3052	40 31 48	3061	39 2 50	3069	37 34 3	3078
	Regulus	E.	77 49 16	3025	76 19 34	3031	74 50 0	3037	73 20 33	3043
	SATURN	E.	81 35 45	2993	80 5 24	3000	78 35 12	3006	77 5 7	3012
31	α Pegasi	W.	90 43 58	3465	92 5 1	3469	93 25 58	3473	94 46 51	3478
	α Arietis	W.	47 19 20	3308	48 43 22	3300	50 7 33	3293	51 31 53	3287
	Pollux	E.	30 12 45	3123	28 45 3	3133	27 17 33	3144	25 50 16	3157
	Regulus	E.	65 54 58	3067	64 26 8	3070	62 57 22	3074	61 28 41	3077
	SATURN	E.	69 36 14	3034	68 6 44	3038	66 37 18	3041	65 7 56	3045

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	SUN	W.	28° 34' 39"	9439	30° 17' 32"	9443	32° 0' 6"	9459	33° 42' 17"	9475
	α Arietis	E.	66 12 6	9371	64 25 24	9290	62 39 10	9311	60 53 27	9338
	Aldebaran	E.	96 31 21	9111	94 40 39	9196	92 50 19	9141	91 0 22	9156
23	SUN	W.	42 7 33	9559	43 47 24	9578	45 26 49	9597	47 5 49	9616
	α Arietis	E.	52 13 17	9490	50 31 8	9490	48 49 41	9521	47 8 57	9556
	Aldebaran	E.	81 56 35	9239	80 9 6	9257	78 22 3	9275	76 35 27	9293
24	SUN	W.	55 14 8	9716	56 50 27	9736	58 26 19	9756	60 1 44	9776
	α Arietis	E.	38 57 45	9757	37 22 21	9808	35 48 3	9893	34 14 55	9891
	Aldebaran	E.	67 49 11	9387	66 5 18	9407	64 21 54	9437	62 38 58	9447
25	SUN	W.	67 52 8	9879	69 24 53	9899	70 57 13	9919	72 29 8	9939
	Aldebaran	E.	54 11 1	9543	52 30 47	9562	50 51 0	9581	49 11 39	9600
26	SUN	W.	80 2 29	9935	81 31 58	9954	83 1 4	9973	84 29 47	9990
	Fomalhaut	W.	55 30 56	9950	57 2 11	9956	58 33 19	9992	60 4 19	9999
	Aldebaran	E.	41 1 19	9693	39 24 30	9711	37 48 5	9730	36 12 5	9748
	Pollux	E.	85 14 36	9699	83 37 46	9709	82 1 18	9796	80 25 12	9743
27	SUN	W.	91 48 8	3174	93 14 48	3190	94 41 9	3205	96 7 12	3220
	Fomalhaut	W.	67 36 32	3018	69 6 22	3098	70 36 0	3037	72 5 26	3047
	α Pegasi	W.	52 41 5	3480	54 1 52	3468	55 22 52	3457	56 44 4	3449
	Aldebaran	E.	26 17 56	9836	26 44 15	9855	25 10 58	9874	23 38 7	9893
	Pollux	E.	72 30 5	9891	70 56 4	9835	69 22 22	9850	67 48 59	9884
28	SUN	W.	103 13 15	3299	104 37 40	3300	106 1 51	3319	107 25 48	3334
	Fomalhaut	W.	79 29 31	3097	80 57 44	3107	82 25 45	3117	83 53 34	3135
	α Pegasi	W.	63 31 53	3496	64 53 40	3494	66 15 29	3493	67 37 19	3492
	Pollux	E.	60 6 21	9939	58 34 39	9941	57 3 13	9953	55 32 1	9964
29	SUN	W.	114 22 25	3375	115 45 10	3385	117 7 44	3393	118 30 9	3400
	Fomalhaut	W.	91 9 57	3168	92 36 42	3176	94 3 17	3185	95 29 42	3194
	α Pegasi	W.	74 26 25	3496	75 48 10	3430	77 9 52	3439	78 31 32	3434
	α Arietis	W.	30 52 11	3533	32 11 59	3496	33 32 28	3466	34 53 30	3438
	Pollux	E.	47 59 23	3015	46 29 29	3025	44 59 47	3034	43 30 16	3043
	Regulus	E.	83 49 34	9995	82 19 15	3003	80 49 6	3010	79 19 6	3018
	SATURN	E.	87 38 36	9995	86 7 39	9973	84 36 52	9960	83 6 14	9967
30	SUN	W.	125 20 6	3435	126 41 43	3441	128 3 13	3446	129 24 37	3452
	Fomalhaut	W.	102 39 25	3233	104 4 55	3240	105 30 16	3248	106 55 27	3255
	α Pegasi	W.	85 19 4	3450	86 40 24	3453	88 1 40	3457	89 22 51	3461
	α Arietis	W.	41 45 4	3350	43 8 18	3337	44 31 47	3336	45 55 28	3317
	Pollux	E.	36 5 26	3098	34 36 59	3095	33 8 43	3104	31 40 38	3114
	Regulus	E.	71 51 14	3048	70 22 1	3053	68 52 54	3058	67 23 53	3063
	SATURN	E.	75 35 9	3017	74 5 17	3091	72 35 30	3096	71 5 49	3030
31	α Pegasi	W.	96 7 39	3483	97 28 22	3488	98 49 0	3493	100 9 31	3499
	α Arietis	W.	52 56 20	3080	54 20 55	3075	55 45 36	3070	57 10 23	3064
	Pollux	E.	24 23 15	3170	22 56 30	3185	21 30 3	3204	20 3 59	3225
	Regulus	E.	60 0 3	3080	58 31 29	3069	57 2 58	3064	55 34 29	3066
	SATURN	E.	63 36 39	3047	62 9 24	3048	60 40 11	3050	59 11 0	3059

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Sat.	1	^h 21 ^m 0 ^s 28.45	10.176	S. 17° 1' 17.3	+42.91	16' 16.04	68.24	13 51.75	0.319
SUN.	2	21 4 32.25	10.142	16 43 58.6	43.64	16 15.89	68.13	13 58.98	0.285
Mon.	3	21 8 35.22	10.107	16 26 22.5	44.36	16 15.74	68.01	14 5.38	0.251
Tues.	4	21 12 37.37	10.073	16 8 29.4	+45.06	16 15.58	67.90	14 10.96	0.217
Wed.	5	21 16 38.71	10.039	15 50 19.7	45.74	16 15.41	67.78	14 15.73	0.183
Thur.	6	21 20 39.24	10.005	15 31 53.8	46.41	16 15.24	67.67	14 19.69	0.149
Frid.	7	21 24 38.96	9.972	15 13 12.0	+47.06	16 15.06	67.55	14 22.84	0.116
Sat.	8	21 28 37.89	9.940	14 54 14.7	47.70	16 14.88	67.44	14 25.21	0.084
SUN.	9	21 32 36.05	9.908	14 35 2.4	48.32	16 14.70	67.33	14 26.81	0.052
Mon.	10	21 36 33.44	9.876	14 15 35.5	+48.92	16 14.51	67.22	14 27.64	0.020
Tues.	11	21 40 30.07	9.845	13 55 54.4	49.51	16 14.32	67.11	14 27.71	0.011
Wed.	12	21 44 25.95	9.814	13 35 59.5	50.08	16 14.12	67.00	14 27.04	0.042
Thur.	13	21 48 21.09	9.783	13 15 51.2	+50.63	16 13.92	66.89	14 25.63	0.073
Frid.	14	21 52 15.50	9.752	12 55 29.8	51.16	16 13.72	66.78	14 23.50	0.103
Sat.	15	21 56 9.19	9.722	12 34 55.8	51.67	16 13.51	66.68	14 20.64	0.133
SUN.	16	22 0 2.16	9.692	12 14 9.6	+52.17	16 13.30	66.58	14 17.06	0.163
Mon.	17	22 3 54.43	9.663	11 53 11.7	52.65	16 13.08	66.48	14 12.78	0.192
Tues.	18	22 7 46.01	9.635	11 32 2.5	53.11	16 12.87	66.38	14 7.82	0.220
Wed.	19	22 11 36.91	9.607	11 10 42.4	+53.56	16 12.65	66.28	14 2.18	0.248
Thur.	20	22 15 27.13	9.579	10 49 11.8	53.99	16 12.43	66.18	13 55.87	0.276
Frid.	21	22 19 16.68	9.552	10 27 31.1	54.40	16 12.21	66.09	13 48.89	0.303
Sat.	22	22 23 5.59	9.525	10 5 40.8	+54.79	16 11.99	66.00	13 41.27	0.330
SUN.	23	22 26 53.86	9.499	9 43 41.4	55.16	16 11.76	65.91	13 33.01	0.356
Mon.	24	22 30 41.50	9.473	9 21 33.3	55.52	16 11.54	65.82	13 24.12	0.382
Tues.	25	22 34 28.53	9.448	8 59 16.8	+55.86	16 11.31	65.73	13 14.62	0.407
Wed.	26	22 38 14.97	9.424	8 36 52.3	56.18	16 11.08	65.64	13 4.54	0.431
Thur.	27	22 42 0.83	9.400	8 14 20.4	56.48	16 10.85	65.56	12 53.88	0.455
Frid.	28	22 45 46.13	9.377	7 51 41.4	56.77	16 10.62	65.48	12 42.66	0.478
Sat.	29	22 49 30.89	9.355	S. 7 28 55.7	+57.03	16 10.38	65.41	12 30.89	0.500

NOTE.—The mean time of semidiameter passing may be found by subtracting 0'.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Sat.	1	^h 21 ^m 0 ^s 26.10	10.175	S. 17° 1' 27.2"	+42.90	^m 13 ^s 51.67	0.319	^h 20 ^m 46 ^s 34.43
SUN.	2	21 4 29.89	10.141	16 44 8.8	43.63	13 58.91	0.285	20 50 30.98
Mon.	3	21 8 32.85	10.107	16 26 33.0	44.85	14 5.32	0.251	20 54 27.54
Tues.	4	21 12 35.00	10.073	16 8 40.1	+45.05	14 10.91	0.217	20 58 24.09
Wed.	5	21 16 36.33	10.039	15 50 30.6	45.73	14 15.69	0.183	21 2 20.65
Thur.	6	21 20 36.86	10.005	15 32 4.9	46.40	14 19.66	0.149	21 6 17.20
Frid.	7	21 24 36.58	9.972	15 13 23.3	+47.05	14 22.82	0.116	21 10 13.76
Sat.	8	21 28 35.51	9.940	14 54 26.2	47.69	14 25.20	0.084	21 14 10.31
SUN.	9	21 32 33.67	9.908	14 35 14.1	48.31	14 26.80	0.052	21 18 6.87
Mon.	10	21 36 31.06	9.876	14 15 47.4	+48.91	14 27.64	0.020	21 22 3.42
Tues.	11	21 40 27.70	9.845	13 56 6.4	49.50	14 27.72	0.011	21 25 59.98
Wed.	12	21 44 23.59	9.814	13 36 11.6	50.07	14 27.05	0.042	21 29 56.53
Thur.	13	21 48 18.74	9.783	13 16 3.4	+50.62	14 25.65	0.073	21 33 53.09
Frid.	14	21 52 13.16	9.753	12 55 42.1	51.15	14 23.52	0.103	21 37 49.64
Sat.	15	21 56 6.86	9.723	12 35 8.2	51.67	14 20.67	0.133	21 41 46.20
SUN.	16	21 59 59.85	9.693	12 14 22.1	+52.17	14 17.10	0.163	21 45 42.75
Mon.	17	22 3 52.14	9.664	11 53 24.2	52.65	14 12.83	0.192	21 49 39.31
Tues.	18	22 7 43.74	9.636	11 32 15.0	53.11	14 7.88	0.220	21 53 35.86
Wed.	19	22 11 34.66	9.608	11 10 55.0	+53.56	14 2.24	0.248	21 57 32.42
Thur.	20	22 15 24.90	9.580	10 49 24.4	53.99	13 55.93	0.276	22 1 28.97
Frid.	21	22 19 14.48	9.553	10 27 43.7	54.40	13 48.96	0.303	22 5 25.52
Sat.	22	22 23 3.42	9.526	10 5 53.4	+54.79	13 41.34	0.330	22 9 22.07
SUN.	23	22 26 51.72	9.500	9 43 54.0	55.16	13 33.09	0.356	22 13 18.63
Mon.	24	22 30 39.39	9.474	9 21 45.8	55.52	13 24.21	0.382	22 17 15.18
Tues.	25	22 34 26.45	9.449	8 59 29.2	+55.86	13 14.71	0.407	22 21 11.74
Wed.	26	22 38 12.92	9.425	8 37 4.6	56.18	13 4.63	0.431	22 25 8.29
Thur.	27	22 41 58.81	9.401	8 14 32.6	56.48	12 53.97	0.455	22 29 4.84
Frid.	28	22 45 44.14	9.378	7 51 53.5	56.77	12 42.75	0.478	22 33 1.39
Sat.	29	22 49 28.94	9.356	S. 7 29 7.6	+57.04	12 30.99	0.500	22 36 57.95

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 hour,
+ 9°.8565.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	32	312° 38' 48.8	39' 0.4	152.12	+ 0.21	9.9937105	+27.0	^h 3 ^m 12 ^s 53.88
2	33	313 39 38.9	39 50.4	152.07	0.35	9.9937767	28.0	3 8 57.97
3	34	314 40 27.8	40 39.2	152.01	0.47	9.9938452	29.0	3 5 2.06
4	35	315 41 15.4	41 26.7	151.96	+ 0.58	9.9939161	+30.0	3 1 6.15
5	36	316 42 1.8	42 13.0	151.91	0.67	9.9939894	31.1	2 57 10.25
6	37	317 42 47.0	42 58.0	151.86	0.74	9.9940652	32.1	2 53 14.35
7	38	318 43 31.0	43 41.8	151.81	+ 0.78	9.9941434	+33.1	2 49 18.44
8	39	319 44 13.9	44 24.5	151.76	0.78	9.9942239	34.0	2 45 22.53
9	40	320 44 55.6	45 6.1	151.71	0.76	9.9943066	34.9	2 41 26.61
10	41	321 45 36.2	45 46.6	151.66	+ 0.71	9.9943913	+35.7	2 37 30.70
11	42	322 46 15.7	46 26.0	151.62	0.63	9.9944778	36.4	2 33 34.79
12	43	323 46 54.1	47 4.3	151.57	0.53	9.9945661	37.1	2 29 38.88
13	44	324 47 31.4	47 41.5	151.53	+ 0.42	9.9946560	+37.8	2 25 42.97
14	45	325 48 7.5	48 17.5	151.48	0.30	9.9947474	38.3	2 21 47.06
15	46	326 48 42.3	48 52.2	151.43	0.17	9.9948400	38.8	2 17 51.15
16	47	327 49 15.8	49 25.5	151.37	+ 0.04	9.9949337	+39.3	2 13 55.24
17	48	328 49 47.9	49 57.5	151.31	− 0.08	9.9950285	39.7	2 9 59.34
18	49	329 50 18.6	50 28.1	151.24	0.19	9.9951242	40.1	2 6 3.43
19	50	330 50 47.7	50 57.1	151.17	− 0.27	9.9952208	+40.4	2 2 7.52
20	51	331 51 15.2	51 24.4	151.10	0.32	9.9953182	40.8	1 58 11.61
21	52	332 51 41.0	51 50.1	151.04	0.35	9.9954164	41.1	1 54 15.71
22	53	333 52 5.1	52 14.1	150.96	− 0.34	9.9955153	+41.4	1 50 19.80
23	54	334 52 27.3	52 36.2	150.88	0.30	9.9956150	41.7	1 46 23.89
24	55	335 52 47.5	52 56.3	150.80	0.24	9.9957156	42.1	1 42 27.98
25	56	336 53 5.7	53 14.4	150.71	− 0.15	9.9958173	+42.6	1 38 32.07
26	57	337 53 22.0	53 30.6	150.63	− 0.04	9.9959200	43.0	1 34 36.17
27	58	338 53 36.2	53 44.7	150.54	+ 0.08	9.9960237	43.5	1 30 40.26
28	59	339 53 48.3	53 56.7	150.46	0.21	9.9961286	44.0	1 26 44.36
29	60	340 53 58.3	54 6.6	150.37	+ 0.35	9.9962348	+44.6	1 22 48.45
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0.								
Diff. for 1 Hour — 9 ^s .8296. (Table II.)								

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	14' 45.5	14' 44.7	54' 2.7	-0.30	54' 0.0	-0.15	9 51.3	2.05	11.5
2	14 44.4	14 44.6	53 59.0	-0.02	53 59.5	+0.11	10 40.6	2.04	12.5
3	14 45.2	14 46.1	54 1.6	+0.23	54 5.0	0.33	11 29.4	2.01	13.5
4	14 47.3	14 48.9	54 9.6	+0.43	54 15.4	+0.53	12 17.0	1.95	14.5
5	14 50.8	14 53.0	54 22.4	0.63	54 30.4	0.71	13 3.1	1.89	15.5
6	14 55.5	14 58.2	54 39.5	0.80	54 49.6	0.89	13 47.8	1.84	16.5
7	15 1.3	15 4.6	55 0.8	+0.98	55 13.1	+1.07	14 31.4	1.84	17.5
8	15 8.3	15 12.2	55 26.5	1.17	55 41.1	1.26	15 14.8	1.85	18.5
9	15 16.5	15 21.1	55 56.8	1.36	56 13.6	1.45	15 58.6	1.87	19.5
10	15 26.0	15 31.2	56 31.6	+1.55	56 50.8	+1.64	16 43.9	1.94	20.5
11	15 36.7	15 42.5	57 11.0	1.72	57 32.1	1.79	17 31.8	2.03	21.5
12	15 48.4	15 54.6	57 54.0	1.85	58 16.5	1.88	18 23.2	2.23	22.5
13	16 0.7	16 6.8	58 39.1	+1.88	59 1.5	+1.85	19 18.9	2.39	23.5
14	16 12.8	16 18.4	59 23.4	1.78	59 44.1	1.66	20 18.7	2.52	24.5
15	16 23.6	16 28.2	60 3.2	1.50	60 20.1	1.29	21 21.3	2.63	25.5
16	16 32.0	16 34.9	60 34.1	+1.03	60 44.8	+0.73	22 24.8	2.61	26.5
17	16 36.8	16 37.6	60 51.7	+0.40	60 54.5	+0.05	23 26.4	2.50	27.5
18	16 37.1	16 35.5	60 52.9	-0.32	60 46.8	-0.69	6		28.5
19	16 32.6	16 28.7	60 36.4	-1.04	60 21.9	-1.36	0 24.9	2.36	0.1
20	16 23.7	16 17.9	60 3.7	1.65	59 42.3	1.90	1 19.6	2.21	1.1
21	16 11.4	16 4.3	59 18.2	2.08	58 52.3	2.22	2 10.9	2.09	2.1
22	15 56.9	15 49.3	58 25.0	-2.30	57 57.1	-2.32	2 59.8	2.00	3.1
23	15 41.7	15 34.2	57 29.3	2.30	57 1.9	2.24	3 47.0	1.95	4.1
24	15 27.1	15 20.3	56 35.6	2.14	56 10.7	2.00	4 33.8	1.95	5.1
25	15 14.0	15 8.3	55 47.6	-1.84	55 26.6	-1.66	5 20.8	1.97	6.1
26	15 3.2	14 58.7	55 7.8	1.46	54 51.5	1.26	6 8.5	2.00	7.1
27	14 55.0	14 51.9	54 37.6	1.05	54 26.3	0.84	6 57.0	2.03	8.1
28	14 49.5	14 47.7	54 17.4	0.63	54 11.1	0.43	7 46.1	2.05	9.1
29	14 46.7	14 46.2	54 7.1	-0.23	54 5.5	-0.05	8 35.5	2.05	10.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	6 ^h 18 ^m 20.06 ^s	2.1486	N.23° 32' 6.2"	1.736	0	8 ^h 1 ^m 22.58 ^s	2.1387	N.22° 47' 0.8"	3.583
1	6 20 28.88	2.1473	23 33 47.0	1.625	1	8 3 30.26	2.1379	22 43 22.6	3.690
2	6 22 37.74	2.1480	23 35 21.2	1.514	2	8 5 37.85	2.1357	22 39 38.0	3.796
3	6 24 46.64	2.1487	23 36 48.7	1.403	3	8 7 45.35	2.1348	22 35 47.0	3.902
4	6 26 55.58	2.1492	23 38 9.5	1.292	4	8 9 52.76	2.1296	22 31 49.7	4.008
5	6 29 4.55	2.1498	23 39 23.7	1.181	5	8 12 0.07	2.1210	22 27 46.0	4.114
6	6 31 13.56	2.1503	23 40 31.2	1.069	6	8 14 7.28	2.1193	22 23 36.0	4.219
7	6 33 22.59	2.1508	23 41 31.9	0.957	7	8 16 14.39	2.1176	22 19 19.8	4.323
8	6 35 31.65	2.1512	23 42 26.0	0.846	8	8 18 21.40	2.1159	22 14 57.3	4.428
9	6 37 40.73	2.1515	23 43 13.4	0.734	9	8 20 28.30	2.1142	22 10 28.5	4.532
10	6 39 49.83	2.1518	23 43 54.1	0.622	10	8 22 35.10	2.1123	22 5 53.5	4.635
11	6 41 58.95	2.1521	23 44 28.0	0.509	11	8 24 41.78	2.1104	22 1 12.3	4.737
12	6 44 8.09	2.1524	23 44 55.2	0.397	12	8 26 48.35	2.1086	21 56 25.0	4.840
13	6 46 17.24	2.1526	23 45 15.7	0.286	13	8 28 54.81	2.1067	21 51 31.5	4.942
14	6 48 26.40	2.1527	23 45 29.5	0.173	14	8 31 1.15	2.1047	21 46 31.9	5.043
15	6 50 35.56	2.1527	23 45 36.5	+ 0.061	15	8 33 7.38	2.1028	21 41 26.3	5.144
16	6 52 44.73	2.1527	23 45 36.8	- 0.051	16	8 35 13.49	2.1008	21 36 14.6	5.246
17	6 54 53.89	2.1527	23 45 30.4	0.163	17	8 37 19.48	2.0988	21 30 56.8	5.347
18	6 57 3.05	2.1526	23 45 17.2	0.276	18	8 39 25.35	2.0967	21 25 33.0	5.447
19	6 59 12.20	2.1525	23 44 57.3	0.387	19	8 41 31.09	2.0947	21 20 3.2	5.546
20	7 1 21.35	2.1524	23 44 30.7	0.499	20	8 43 36.71	2.0926	21 14 27.5	5.644
21	7 3 30.49	2.1522	23 43 57.4	0.611	21	8 45 42.20	2.0904	21 8 45.9	5.743
22	7 5 39.61	2.1519	23 43 17.4	0.723	22	8 47 47.56	2.0883	21 2 58.4	5.841
23	7 7 48.72	2.1516	N.23 42 30.6	0.836	23	8 49 52.80	2.0862	N.20 57 5.0	5.938
SUNDAY 2.					TUESDAY 4.				
0	7 9 57.81	2.1512	N.23 41 37.1	0.947	0	8 51 57.91	2.0840	N.20 51 5.8	6.035
1	7 12 6.87	2.1508	23 40 36.9	1.059	1	8 54 2.88	2.0818	20 45 0.8	6.139
2	7 14 15.91	2.1504	23 39 30.0	1.171	2	8 56 7.72	2.0796	20 38 50.0	6.237
3	7 16 24.92	2.1499	23 38 16.4	1.282	3	8 58 12.43	2.0773	20 32 33.5	6.329
4	7 18 33.90	2.1493	23 36 56.1	1.394	4	9 0 17.00	2.0751	20 26 11.3	6.417
5	7 20 42.84	2.1487	23 35 29.1	1.505	5	9 2 21.44	2.0728	20 19 43.4	6.512
6	7 22 51.75	2.1481	23 33 55.5	1.616	6	9 4 25.74	2.0705	20 13 9.9	6.605
7	7 25 0.62	2.1474	23 32 15.2	1.727	7	9 6 29.90	2.0682	20 6 30.8	6.698
8	7 27 9.44	2.1467	23 30 28.2	1.838	8	9 8 33.92	2.0659	19 59 46.1	6.791
9	7 29 18.22	2.1459	23 28 34.6	1.948	9	9 10 37.81	2.0636	19 52 55.9	6.883
10	7 31 26.95	2.1451	23 26 34.4	2.059	10	9 12 41.56	2.0612	19 46 0.2	6.974
11	7 33 35.63	2.1442	23 24 27.5	2.170	11	9 14 45.16	2.0588	19 38 59.0	7.065
12	7 35 44.26	2.1433	23 22 14.0	2.280	12	9 16 48.62	2.0565	19 31 52.4	7.155
13	7 37 52.83	2.1423	23 19 53.9	2.390	13	9 18 51.94	2.0541	19 24 40.4	7.244
14	7 40 1.34	2.1413	23 17 27.2	2.500	14	9 20 55.12	2.0517	19 17 23.1	7.333
15	7 42 9.79	2.1402	23 14 53.9	2.609	15	9 22 58.15	2.0493	19 10 0.4	7.422
16	7 44 18.17	2.1391	23 12 14.1	2.718	16	9 25 1.04	2.0470	19 2 32.4	7.510
17	7 46 26.48	2.1380	23 9 27.7	2.827	17	9 27 3.79	2.0447	18 54 59.2	7.597
18	7 48 34.73	2.1368	23 6 34.8	2.937	18	9 29 6.40	2.0423	18 47 20.8	7.683
19	7 50 42.90	2.1356	23 3 35.3	3.046	19	9 31 8.86	2.0398	18 39 37.2	7.769
20	7 52 51.00	2.1343	23 0 29.3	3.154	20	9 33 11.18	2.0374	18 31 48.5	7.855
21	7 54 59.02	2.1330	22 57 16.9	3.261	21	9 35 13.35	2.0350	18 23 54.6	7.940
22	7 57 6.96	2.1316	22 53 58.0	3.369	22	9 37 15.38	2.0326	18 15 55.7	8.024
23	7 59 14.81	2.1302	22 50 32.6	3.476	23	9 39 17.26	2.0302	18 7 51.8	8.107
24	8 1 22.58	2.1287	N.22 47 0.8	3.583	24	9 41 19.00	2.0277	N.17 59 42.9	8.190

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
0	9 41 19.00	2.0977	N.17° 59' 42.9	8.190	0	11 16 8.29	1.9323	N.10° 4' 19.7	11.344
1	9 43 20.59	2.0953	17 51 29.0	8.273	1	11 18 4.19	1.9311	9 52 57.6	11.391
2	9 45 22.04	2.0930	17 43 10.2	8.353	2	11 20 0.02	1.9298	9 41 32.7	11.438
3	9 47 23.35	2.0906	17 34 46.6	8.433	3	11 21 55.77	1.9286	9 30 5.0	11.485
4	9 49 24.52	2.0182	17 26 18.2	8.513	4	11 23 51.45	1.9275	9 18 34.5	11.532
5	9 51 25.54	2.0158	17 17 45.0	8.593	5	11 25 47.07	1.9265	9 7 1.2	11.577
6	9 53 26.42	2.0135	17 9 7.0	8.672	6	11 27 42.63	1.9255	8 55 25.3	11.620
7	9 55 27.16	2.0111	17 0 24.3	8.750	7	11 29 38.13	1.9245	8 43 46.8	11.663
8	9 57 27.76	2.0087	16 51 37.0	8.828	8	11 31 33.57	1.9235	8 32 5.7	11.706
9	9 59 28.21	2.0063	16 42 45.0	8.905	9	11 33 28.95	1.9226	8 20 22.1	11.748
10	10 1 28.52	2.0040	16 33 48.4	8.981	10	11 35 24.28	1.9218	8 8 36.0	11.789
11	10 3 28.69	2.0017	16 24 47.3	9.056	11	11 37 19.56	1.9210	7 56 47.4	11.830
12	10 5 28.73	1.9995	16 15 41.7	9.131	12	11 39 14.80	1.9202	7 44 56.4	11.869
13	10 7 28.63	1.9979	16 6 31.6	9.205	13	11 41 9.99	1.9195	7 33 3.1	11.908
14	10 9 28.39	1.9949	15 57 17.1	9.278	14	11 43 5.14	1.9188	7 21 7.5	11.946
15	10 11 28.01	1.9926	15 47 58.3	9.350	15	11 45 0.25	1.9180	7 9 9.6	11.983
16	10 13 27.50	1.9904	15 38 35.1	9.422	16	11 46 55.33	1.9177	6 57 9.5	12.020
17	10 15 26.86	1.9889	15 29 7.6	9.494	17	11 48 50.38	1.9173	6 45 7.2	12.056
18	10 17 26.08	1.9859	15 19 35.8	9.565	18	11 50 45.40	1.9167	6 33 2.8	12.091
19	10 19 25.17	1.9837	15 9 59.8	9.634	19	11 52 40.39	1.9163	6 20 56.3	12.125
20	10 21 24.13	1.9816	15 0 19.7	9.703	20	11 54 35.36	1.9160	6 8 47.8	12.158
21	10 23 22.96	1.9794	14 50 35.5	9.771	21	11 56 30.31	1.9157	5 56 37.3	12.191
22	10 25 21.66	1.9773	14 40 47.2	9.839	22	11 58 25.25	1.9155	5 44 24.9	12.223
23	10 27 20.24	1.9753	N.14 30 54.8	9.907	23	12 0 20.17	1.9153	N. 5 32 10.6	12.254
THURSDAY 6.					SATURDAY 8.				
0	10 29 18.69	1.9739	N.14 20 58.4	9.973	0	12 2 15.08	1.9152	N. 5 19 54.4	12.285
1	10 31 17.02	1.9711	14 10 58.1	10.038	1	12 4 9.99	1.9151	5 7 36.4	12.314
2	10 33 15.22	1.9690	14 0 53.9	10.103	2	12 6 4.89	1.9150	4 55 16.7	12.343
3	10 35 13.30	1.9670	13 50 45.8	10.168	3	12 7 59.79	1.9150	4 42 55.3	12.371
4	10 37 11.26	1.9651	13 40 33.8	10.231	4	12 9 54.69	1.9151	4 30 32.2	12.398
5	10 39 9.11	1.9632	13 30 18.1	10.293	5	12 11 49.60	1.9152	4 18 7.5	12.425
6	10 41 6.84	1.9619	13 19 58.7	10.354	6	12 13 44.52	1.9154	4 5 41.2	12.451
7	10 43 4.46	1.9603	13 9 35.6	10.416	7	12 15 39.45	1.9157	3 53 13.4	12.475
8	10 45 1.96	1.9574	12 59 8.8	10.477	8	12 17 34.40	1.9160	3 40 44.2	12.499
9	10 46 59.35	1.9556	12 48 38.4	10.536	9	12 19 29.37	1.9164	3 28 13.5	12.523
10	10 48 56.63	1.9538	12 38 4.5	10.595	10	12 21 24.37	1.9168	3 15 41.4	12.546
11	10 50 53.81	1.9521	12 27 27.0	10.654	11	12 23 19.39	1.9173	3 3 8.0	12.567
12	10 52 50.88	1.9504	12 16 46.0	10.712	12	12 25 14.44	1.9178	2 50 33.4	12.588
13	10 54 47.85	1.9487	12 6 1.6	10.768	13	12 27 9.53	1.9185	2 37 57.5	12.608
14	10 56 44.72	1.9470	11 55 13.8	10.824	14	12 29 4.66	1.9191	2 25 20.4	12.627
15	10 58 41.49	1.9453	11 44 22.7	10.879	15	12 30 59.82	1.9198	2 12 42.2	12.646
16	11 0 38.16	1.9437	11 33 28.3	10.933	16	12 32 55.03	1.9206	2 0 2.9	12.664
17	11 2 34.73	1.9421	11 22 30.7	10.987	17	12 34 50.29	1.9214	1 47 22.5	12.682
18	11 4 31.21	1.9406	11 11 29.8	11.041	18	12 36 45.60	1.9223	1 34 41.1	12.698
19	11 6 27.60	1.9392	11 0 25.8	11.093	19	12 38 40.97	1.9233	1 21 58.8	12.713
20	11 8 23.91	1.9377	10 49 18.7	11.144	20	12 40 36.40	1.9243	1 9 15.6	12.727
21	11 10 20.13	1.9363	10 38 8.5	11.196	21	12 42 31.89	1.9254	0 56 31.6	12.740
22	11 12 16.27	1.9349	10 26 55.2	11.247	22	12 44 27.45	1.9266	0 43 46.8	12.753
23	11 14 12.32	1.9335	10 15 38.9	11.296	23	12 46 23.08	1.9279	0 31 1.2	12.766
24	11 16 8.29	1.9323	N.10 4 19.7	11.344	24	12 48 18.79	1.9292	N. 0 18 14.9	12.777

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	^h 12 ^m 48 ^s 18.79	1.9292	N. 0° 18' 14.9"	12.777	0	^h 14 ^m 23 ^s 38.56	2.0691	S. 9° 51' 0.7"	12.943
1	12 50 14.58	1.9305	N. 0 5 28.0	12.787	1	14 25 42.84	2.0737	10 3 14.2	12.907
2	12 52 10.45	1.9318	S. 0 7 19.5	12.796	2	14 27 47.40	2.0783	10 15 25.5	12.169
3	12 54 6.40	1.9332	0 20 7.5	12.804	3	14 29 52.23	2.0829	10 27 34.5	12.131
4	12 56 2.44	1.9348	0 32 56.0	12.812	4	14 31 57.35	2.0877	10 39 41.2	12.092
5	12 57 58.58	1.9365	0 45 45.0	12.820	5	14 34 2.76	2.0926	10 51 45.5	12.051
6	12 59 54.82	1.9382	0 58 34.4	12.826	6	14 36 8.47	2.0976	11 3 47.3	12.009
7	13 1 51.16	1.9399	1 11 24.1	12.831	7	14 38 14.47	2.1025	11 15 46.6	11.967
8	13 3 47.60	1.9416	1 24 14.1	12.835	8	14 40 20.77	2.1075	11 27 43.3	11.923
9	13 5 44.15	1.9435	1 37 4.3	12.838	9	14 42 27.37	2.1126	11 39 37.3	11.877
10	13 7 40.82	1.9455	1 49 54.7	12.841	10	14 44 34.28	2.1177	11 51 28.5	11.830
11	13 9 37.61	1.9474	2 2 45.3	12.843	11	14 46 41.50	2.1230	12 3 16.9	11.782
12	13 11 34.51	1.9494	2 15 35.9	12.843	12	14 48 49.04	2.1283	12 15 2.4	11.733
13	13 13 31.54	1.9516	2 28 26.5	12.843	13	14 50 56.90	2.1337	12 26 44.9	11.683
14	13 15 28.70	1.9538	2 41 17.1	12.843	14	14 53 5.08	2.1390	12 38 24.4	11.632
15	13 17 26.00	1.9561	2 54 7.7	12.841	15	14 55 13.58	2.1444	12 50 0.8	11.580
16	13 19 23.43	1.9584	3 6 58.1	12.838	16	14 57 22.41	2.1499	13 1 34.0	11.526
17	13 21 21.01	1.9608	3 19 48.3	12.835	17	14 59 31.57	2.1555	13 13 3.9	11.471
18	13 23 18.73	1.9632	3 32 38.3	12.831	18	15 1 41.07	2.1611	13 24 30.5	11.415
19	13 25 16.60	1.9658	3 45 28.0	12.825	19	15 3 50.91	2.1668	13 35 53.7	11.357
20	13 27 14.63	1.9684	3 58 17.3	12.818	20	15 6 1.09	2.1726	13 47 13.4	11.298
21	13 29 12.81	1.9711	4 11 6.2	12.811	21	15 8 11.62	2.1784	13 58 29.5	11.237
22	13 31 11.16	1.9738	4 23 54.6	12.803	22	15 10 22.50	2.1842	14 9 41.9	11.175
23	13 33 9.67	1.9766	S. 4 36 42.6	12.795	23	15 12 33.73	2.1901	S. 14 20 50.5	11.112
MONDAY 10.					WEDNESDAY 12.				
0	13 35 8.35	1.9794	S. 4 49 30.0	12.784	0	15 14 45.31	2.1960	S. 14 31 55.3	11.048
1	13 37 7.20	1.9823	5 2 16.7	12.773	1	15 16 57.25	2.2020	14 42 56.3	10.983
2	13 39 6.23	1.9854	5 15 2.7	12.761	2	15 19 9.55	2.2081	14 53 53.3	10.916
3	13 41 5.45	1.9886	5 27 48.0	12.748	3	15 21 22.22	2.2142	15 4 46.2	10.847
4	13 43 4.86	1.9917	5 40 32.5	12.735	4	15 23 35.26	2.2204	15 15 35.0	10.777
5	13 45 4.46	1.9949	5 53 16.2	12.720	5	15 25 48.67	2.2266	15 26 19.5	10.706
6	13 47 4.25	1.9982	6 5 58.9	12.704	6	15 28 2.45	2.2328	15 36 59.7	10.633
7	13 49 4.24	2.0016	6 18 40.6	12.687	7	15 30 16.61	2.2391	15 47 35.5	10.560
8	13 51 4.44	2.0050	6 31 21.3	12.669	8	15 32 31.14	2.2453	15 58 6.9	10.485
9	13 53 4.84	2.0084	6 44 0.9	12.650	9	15 34 46.05	2.2517	16 8 33.7	10.408
10	13 55 5.45	2.0120	6 56 39.3	12.630	10	15 37 1.34	2.2581	16 18 55.8	10.329
11	13 57 6.28	2.0157	7 9 16.5	12.610	11	15 39 17.02	2.2646	16 29 13.2	10.250
12	13 59 7.33	2.0194	7 21 52.5	12.588	12	15 41 33.09	2.2711	16 39 25.8	10.169
13	14 1 8.61	2.0231	7 34 27.1	12.565	13	15 43 49.55	2.2776	16 49 33.5	10.087
14	14 3 10.11	2.0269	7 47 0.3	12.541	14	15 46 6.40	2.2841	16 59 36.2	10.003
15	14 5 11.84	2.0308	7 59 32.0	12.516	15	15 48 23.64	2.2906	17 9 33.8	9.918
16	14 7 13.81	2.0348	8 12 2.2	12.490	16	15 50 41.27	2.2972	17 19 26.3	9.831
17	14 9 16.02	2.0388	8 24 30.8	12.462	17	15 52 59.30	2.3038	17 29 13.5	9.742
18	14 11 18.47	2.0429	8 36 57.7	12.434	18	15 55 17.72	2.3104	17 38 55.4	9.653
19	14 13 21.17	2.0472	8 49 22.9	12.405	19	15 57 36.54	2.3171	17 48 31.9	9.562
20	14 15 24.13	2.0514	9 1 46.3	12.375	20	15 59 55.77	2.3238	17 58 2.9	9.469
21	14 17 27.34	2.0557	9 14 7.9	12.343	21	16 2 15.40	2.3305	18 7 28.2	9.374
22	14 19 30.81	2.0601	9 26 27.5	12.310	22	16 4 35.43	2.3372	18 16 47.8	9.279
23	14 21 34.55	2.0646	9 38 45.1	12.277	23	16 6 55.86	2.3439	18 26 1.7	9.182
24	14 23 38.56	2.0691	S. 9 51 0.7	12.243	24	16 9 16.70	2.3507	S. 18 35 9.7	9.083

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	16 9 16.70	2.3507	S. 18° 35' 9.7"	9.083	0	18 9 31.28	2.6389	S. 23° 29' 28.2"	2.647
1	16 11 37.95	2.3575	18 44 11.7	6.983	1	18 12 9.74	2.6430	23 32 2.1	2.489
2	16 13 59.60	2.3642	18 53 7.7	8.889	2	18 14 48.44	2.6469	23 34 26.1	2.317
3	16 16 21.65	2.3709	19 1 57.6	8.780	3	18 17 27.37	2.6507	23 36 40.1	2.150
4	16 18 44.11	2.3777	19 10 41.3	8.675	4	18 20 6.52	2.6544	23 38 44.1	1.989
5	16 21 6.98	2.3845	19 19 18.6	8.567	5	18 22 45.90	2.6581	23 40 38.0	1.814
6	16 23 30.25	2.3913	19 27 49.4	8.459	6	18 25 25.49	2.6615	23 42 21.8	1.645
7	16 25 53.93	2.3981	19 36 13.7	8.351	7	18 28 5.28	2.6648	23 43 55.4	1.475
8	16 28 18.02	2.4048	19 44 31.5	8.241	8	18 30 45.27	2.6680	23 45 18.8	1.305
9	16 30 42.51	2.4116	19 52 42.6	8.128	9	18 33 25.44	2.6710	23 46 32.0	1.134
10	16 33 7.41	2.4183	20 0 46.9	8.014	10	18 36 5.79	2.6739	23 47 34.9	0.969
11	16 35 32.71	2.4251	20 8 44.3	7.899	11	18 36 46.31	2.6767	23 48 27.4	0.789
12	16 37 58.42	2.4318	20 16 34.8	7.782	12	18 41 27.00	2.6794	23 49 9.5	0.615
13	16 40 24.53	2.4385	20 24 18.2	7.664	13	18 44 7.84	2.6818	23 49 41.2	0.449
14	16 42 51.04	2.4452	20 31 54.5	7.545	14	18 46 48.82	2.6841	23 50 2.5	0.286
15	16 45 17.95	2.4518	20 39 23.6	7.424	15	18 49 29.93	2.6869	23 50 13.4	- 0.094
16	16 47 45.26	2.4585	20 46 45.4	7.301	16	18 52 11.17	2.6893	23 50 13.8	+ 0.081
17	16 50 12.97	2.4651	20 53 59.7	7.176	17	18 54 52.53	2.6908	23 50 3.7	0.257
18	16 52 41.07	2.4717	21 1 6.5	7.050	18	18 57 33.99	2.6918	23 49 43.0	0.439
19	16 55 9.57	2.4782	21 8 5.7	6.923	19	19 0 15.55	2.6935	23 49 11.8	0.608
20	16 57 38.45	2.4846	21 14 57.3	6.796	20	19 2 57.21	2.6949	23 48 30.0	0.785
21	17 0 7.72	2.4911	21 21 41.2	6.666	21	19 5 38.94	2.6961	23 47 37.6	0.969
22	17 2 37.38	2.4975	21 28 17.2	6.533	22	19 8 20.74	2.6979	23 46 34.6	1.138
23	17 5 7.42	2.5038	S. 21 34 45.2	6.400	23	19 11 2.60	2.6998	S. 23 45 21.0	1.314
FRIDAY 14.					SUNDAY 16.				
0	17 7 37.84	2.5101	S. 21 41 5.2	6.266	0	19 13 44.52	2.6990	S. 23 43 56.9	1.490
1	17 10 8.64	2.5164	21 47 17.1	6.130	1	19 16 26.48	2.6996	23 42 22.2	1.668
2	17 12 39.81	2.5226	21 53 20.8	5.992	2	19 19 8.47	2.7001	23 40 36.8	1.846
3	17 15 11.35	2.5287	21 59 16.2	5.854	3	19 21 50.49	2.7004	23 38 40.7	2.023
4	17 17 43.26	2.5348	22 5 3.3	5.714	4	19 24 32.52	2.7005	23 36 34.0	2.200
5	17 20 15.53	2.5409	22 10 41.9	5.573	5	19 27 14.55	2.7005	23 34 16.7	2.376
6	17 22 48.17	2.5469	22 16 12.0	5.430	6	19 29 56.58	2.7004	23 31 48.9	2.552
7	17 25 21.16	2.5527	22 21 33.5	5.286	7	19 32 38.60	2.7001	23 29 10.5	2.728
8	17 27 54.50	2.5585	22 26 46.3	5.141	8	19 35 20.59	2.6996	23 26 21.5	2.905
9	17 30 28.18	2.5642	22 31 50.4	4.994	9	19 38 2.55	2.6990	23 23 21.9	3.081
10	17 33 2.20	2.5698	22 36 45.6	4.845	10	19 40 44.47	2.6989	23 20 11.8	3.256
11	17 35 36.56	2.5754	22 41 31.8	4.695	11	19 43 26.34	2.6979	23 16 51.2	3.431
12	17 38 11.25	2.5808	22 46 9.0	4.545	12	19 46 8.14	2.6961	23 13 20.1	3.606
13	17 40 46.26	2.5862	22 50 37.2	4.393	13	19 48 49.87	2.6949	23 9 38.5	3.780
14	17 43 21.60	2.5916	22 54 56.2	4.240	14	19 51 31.53	2.6937	23 5 46.5	3.953
15	17 45 57.25	2.5969	22 59 6.0	4.086	15	19 54 13.11	2.6929	23 1 44.1	4.127
16	17 48 33.21	2.6019	23 3 6.5	3.931	16	19 56 54.60	2.6905	22 57 31.3	4.300
17	17 51 9.48	2.6069	23 6 57.7	3.775	17	19 59 35.97	2.6885	22 53 8.1	4.472
18	17 53 46.04	2.6118	23 10 39.5	3.617	18	20 2 17.22	2.6865	22 48 34.6	4.643
19	17 56 22.89	2.6166	23 14 11.8	3.458	19	20 4 58.35	2.6845	22 43 50.9	4.813
20	17 59 0.03	2.6213	23 17 34.5	3.297	20	20 7 39.36	2.6823	22 38 57.0	4.983
21	18 1 37.44	2.6258	23 20 47.5	3.136	21	20 10 20.23	2.6799	22 33 52.9	5.153
22	18 4 15.12	2.6303	23 23 50.8	2.974	22	20 13 0.95	2.6774	22 28 38.7	5.321
23	18 6 53.07	2.6347	23 26 44.4	2.812	23	20 15 41.52	2.6747	22 23 14.4	5.487
24	18 9 31.28	2.6389	S. 23 29 28.2	2.647	24	20 18 21.92	2.6719	S. 22 17 40.2	5.653

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	^h 20 ^m 18 ^s 21.92	2.6719	S. 22° 17' 40.2"	5.653	0	^h 22 ^m 21 ^s 30.49	2.4349	S. 14° 59' 22.2"	11.999
1	20 21 2.15	2.6690	22 11 56.0	5.819	1	22 23 56.36	2.4289	14 47 20.0	12.061
2	20 23 42.20	2.6660	22 6 1.9	5.984	2	22 26 21.87	2.4229	14 35 12.5	12.168
3	20 26 22.07	2.6628	21 59 57.9	6.148	3	22 28 47.03	2.4163	14 22 59.8	12.254
4	20 29 1.74	2.6595	21 53 44.1	6.310	4	22 31 11.83	2.4103	14 10 42.0	12.338
5	20 31 41.21	2.6561	21 47 20.7	6.471	5	22 33 36.27	2.4043	13 58 19.2	12.420
6	20 34 20.47	2.6526	21 40 47.6	6.633	6	22 36 0.35	2.3984	13 45 51.6	12.499
7	20 36 59.52	2.6490	21 34 4.9	6.791	7	22 38 24.08	2.3926	13 33 19.3	12.577
8	20 39 38.35	2.6452	21 27 12.7	6.948	8	22 40 47.46	2.3867	13 20 42.4	12.653
9	20 42 16.95	2.6413	21 20 11.1	7.105	9	22 43 10.48	2.3808	13 8 0.9	12.728
10	20 44 55.31	2.6372	21 13 0.1	7.261	10	22 45 33.15	2.3749	12 55 15.0	12.800
11	20 47 33.42	2.6331	21 5 39.8	7.414	11	22 47 55.47	2.3691	12 42 24.9	12.869
12	20 50 11.28	2.6289	20 58 10.4	7.567	12	22 50 17.45	2.3634	12 29 30.7	12.938
13	20 52 48.89	2.6247	20 50 31.8	7.719	13	22 52 39.08	2.3576	12 16 32.4	13.005
14	20 55 26.24	2.6203	20 42 44.1	7.869	14	22 55 0.36	2.3518	12 3 30.1	13.070
15	20 58 3.33	2.6159	20 34 47.5	8.018	15	22 57 21.30	2.3461	11 50 24.0	13.132
16	21 0 40.15	2.6113	20 26 42.0	8.165	16	22 59 41.90	2.3405	11 37 14.2	13.193
17	21 3 16.68	2.6065	20 18 27.7	8.310	17	23 2 2.16	2.3348	11 24 0.8	13.252
18	21 5 52.93	2.6017	20 10 4.8	8.454	18	23 4 22.07	2.3291	11 10 43.9	13.310
19	21 8 28.89	2.5969	20 1 33.3	8.597	19	23 6 41.65	2.3236	10 57 23.6	13.366
20	21 11 4.56	2.5920	19 52 53.2	8.739	20	23 9 0.90	2.3180	10 44 0.0	13.419
21	21 13 39.93	2.5870	19 44 4.6	8.879	21	23 11 19.81	2.3125	10 30 33.3	13.471
22	21 16 15.00	2.5820	19 35 7.7	9.017	22	23 13 38.40	2.3071	10 17 3.5	13.521
23	21 18 49.77	2.5770	S. 19° 26' 2.6"	9.153	23	23 15 56.66	2.3016	S. 10° 3' 30.8"	13.568
TUESDAY 18.					THURSDAY 20.				
0	21 21 24.24	2.5718	S. 19° 16' 49.4"	9.287	0	23 18 14.59	2.2962	S. 9° 49' 55.3"	13.614
1	21 23 58.39	2.5664	19 7 28.2	9.430	1	23 20 32.20	2.2909	9 36 17.1	13.659
2	21 26 32.21	2.5610	18 57 59.0	9.562	2	23 22 49.49	2.2856	9 22 36.2	13.702
3	21 29 5.71	2.5556	18 48 22.0	9.693	3	23 25 6.47	2.2803	9 8 52.8	13.743
4	21 31 38.88	2.5509	18 38 37.2	9.810	4	23 27 23.13	2.2752	8 55 7.0	13.782
5	21 34 11.73	2.5447	18 28 44.8	9.936	5	23 29 39.59	2.2701	8 41 18.9	13.820
6	21 36 44.25	2.5399	18 18 44.9	10.060	6	23 31 55.54	2.2650	8 27 28.6	13.856
7	21 39 16.43	2.5336	18 8 37.6	10.183	7	23 34 11.29	2.2599	8 13 36.2	13.890
8	21 41 48.28	2.5280	17 58 22.9	10.305	8	23 36 26.73	2.2548	7 59 41.8	13.922
9	21 44 19.79	2.5223	17 48 1.0	10.424	9	23 38 41.87	2.2499	7 45 45.6	13.952
10	21 46 50.96	2.5166	17 37 32.0	10.542	10	23 40 56.72	2.2450	7 31 47.6	13.981
11	21 49 21.78	2.5109	17 26 56.0	10.657	11	23 43 11.27	2.2401	7 17 47.9	14.008
12	21 51 52.26	2.5051	17 16 13.2	10.770	12	23 45 25.53	2.2353	7 3 46.6	14.034
13	21 54 22.39	2.4998	17 5 23.6	10.882	13	23 47 39.51	2.2306	6 49 43.8	14.057
14	21 56 52.17	2.4934	16 54 27.3	10.993	14	23 49 53.20	2.2259	6 35 39.7	14.079
15	21 59 21.60	2.4875	16 43 24.4	11.102	15	23 52 6.62	2.2214	6 21 34.3	14.101
16	22 1 50.67	2.4816	16 32 15.1	11.208	16	23 54 19.77	2.2168	6 7 27.6	14.120
17	22 4 19.39	2.4757	16 20 59.5	11.313	17	23 56 32.64	2.2122	5 53 19.9	14.136
18	22 6 47.76	2.4698	16 9 37.6	11.416	18	23 58 45.24	2.2078	5 39 11.3	14.151
19	22 9 15.77	2.4639	15 58 9.6	11.517	19	0 0 57.58	2.2035	5 25 1.8	14.166
20	22 11 43.43	2.4580	15 46 35.6	11.615	20	0 3 9.66	2.1991	5 10 51.4	14.179
21	22 14 10.73	2.4520	15 34 55.8	11.712	21	0 5 21.48	2.1948	4 56 40.3	14.190
22	22 16 37.67	2.4461	15 23 10.2	11.807	22	0 7 33.04	2.1906	4 42 28.6	14.199
23	22 19 4.26	2.4402	15 11 19.0	11.900	23	0 9 44.35	2.1864	4 28 16.4	14.207
24	22 21 30.49	2.4342	S. 14° 59' 22.2"	11.999	24	0 11 55.41	2.1823	S. 4° 14' 3.7"	14.214

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	0 11 55.41	2.1833	S. 4 14' 3.7	14.214	0	1 53 11.03	2.0610	N. 6 50' 8.0	13.008
1	0 14 6.23	2.1784	3 59 50.7	14.219	1	1 55 14.66	2.0600	7 3 6.9	12.968
2	0 16 16.82	2.1745	3 45 37.4	14.222	2	1 57 18.23	2.0590	7 16 2.7	12.904
3	0 18 27.17	2.1706	3 31 24.0	14.224	3	1 59 21.74	2.0580	7 28 55.4	12.852
4	0 20 37.29	2.1667	3 17 10.5	14.224	4	2 1 25.19	2.0572	7 41 44.9	12.798
5	0 22 47.18	2.1629	3 2 57.1	14.223	5	2 3 28.60	2.0564	7 54 31.1	12.743
6	0 24 56.84	2.1592	2 48 43.7	14.222	6	2 5 31.96	2.0556	8 7 14.0	12.688
7	0 27 6.29	2.1556	2 34 30.5	14.218	7	2 7 35.27	2.0548	8 19 53.5	12.632
8	0 29 15.52	2.1520	2 20 17.6	14.212	8	2 9 38.54	2.0540	8 32 29.5	12.579
9	0 31 24.53	2.1484	2 6 5.1	14.205	9	2 11 41.78	2.0537	8 45 2.1	12.514
10	0 33 33.33	2.1450	1 51 53.0	14.197	10	2 13 44.99	2.0539	8 57 31.2	12.455
11	0 35 41.92	2.1417	1 37 41.4	14.189	11	2 15 48.17	2.0537	9 9 56.7	12.394
12	0 37 50.33	2.1384	1 23 30.3	14.179	12	2 17 51.32	2.0523	9 22 18.5	12.333
13	0 39 58.53	2.1351	1 9 19.9	14.167	13	2 19 54.45	2.0519	9 34 36.7	12.279
14	0 42 6.54	2.1319	0 55 10.3	14.153	14	2 21 57.55	2.0515	9 46 51.2	12.211
15	0 44 14.36	2.1287	0 41 1.6	14.138	15	2 24 0.63	2.0512	9 59 2.0	12.148
16	0 46 21.99	2.1257	0 26 53.8	14.122	16	2 26 3.70	2.0510	10 11 8.9	12.083
17	0 48 29.44	2.1227	S. 0 12 47.0	14.105	17	2 28 6.75	2.0508	10 23 11.9	12.018
18	0 50 36.71	2.1197	N. 0 1 18.8	14.087	18	2 30 9.79	2.0507	10 35 11.0	11.953
19	0 52 43.81	2.1169	0 15 23.5	14.067	19	2 32 12.83	2.0506	10 47 6.2	11.887
20	0 54 50.74	2.1141	0 29 26.9	14.046	20	2 34 15.86	2.0505	10 58 57.4	11.820
21	0 56 57.50	2.1113	0 43 29.0	14.023	21	2 36 18.89	2.0505	11 10 44.6	11.752
22	0 59 4.09	2.1086	0 57 29.7	14.000	22	2 38 21.92	2.0505	11 22 27.7	11.684
23	1 1 10.53	2.1061	N. 1 11 29.0	13.976	23	2 40 24.95	2.0506	N. 11 34 6.7	11.615
SATURDAY 22.					MONDAY 24.				
0	1 3 16.82	2.1036	N. 1 25 26.8	13.950	0	2 42 27.99	2.0507	N. 11 45 41.5	11.545
1	1 5 22.96	2.1011	1 39 23.0	13.923	1	2 44 31.04	2.0509	11 57 12.1	11.475
2	1 7 28.95	2.0986	1 53 17.6	13.895	2	2 46 34.10	2.0512	12 8 38.5	11.404
3	1 9 34.79	2.0962	2 7 10.4	13.865	3	2 48 37.18	2.0514	12 20 0.6	11.332
4	1 11 40.49	2.0939	2 21 1.4	13.835	4	2 50 40.27	2.0517	12 31 18.4	11.260
5	1 13 46.06	2.0917	2 34 50.6	13.804	5	2 52 43.38	2.0521	12 42 31.8	11.187
6	1 15 51.50	2.0896	2 48 37.9	13.772	6	2 54 46.52	2.0525	12 53 40.8	11.113
7	1 17 56.81	2.0875	3 2 23.2	13.738	7	2 56 49.68	2.0529	13 4 45.4	11.039
8	1 20 2.00	2.0854	3 16 6.4	13.703	8	2 58 52.87	2.0533	13 15 45.5	10.964
9	1 22 7.06	2.0834	3 29 47.5	13.667	9	3 0 56.08	2.0537	13 26 41.0	10.888
10	1 24 12.01	2.0815	3 43 26.4	13.630	10	3 2 59.32	2.0543	13 37 32.0	10.819
11	1 26 16.84	2.0796	3 57 3.1	13.592	11	3 5 2.60	2.0549	13 48 18.4	10.736
12	1 28 21.56	2.0778	4 10 37.5	13.553	12	3 7 5.91	2.0555	13 59 0.2	10.657
13	1 30 26.17	2.0761	4 24 9.5	13.513	13	3 9 9.26	2.0562	14 9 37.3	10.579
14	1 32 30.69	2.0745	4 37 39.1	13.472	14	3 11 12.65	2.0569	14 20 9.7	10.500
15	1 34 35.11	2.0729	4 51 6.2	13.430	15	3 13 16.08	2.0576	14 30 37.3	10.420
16	1 36 39.44	2.0713	5 4 30.7	13.387	16	3 15 19.56	2.0583	14 41 0.1	10.340
17	1 38 43.67	2.0697	5 17 52.6	13.342	17	3 17 23.08	2.0591	14 51 18.1	10.260
18	1 40 47.81	2.0683	5 31 11.8	13.297	18	3 19 26.65	2.0599	15 1 31.3	10.179
19	1 42 51.87	2.0670	5 44 28.3	13.252	19	3 21 30.27	2.0607	15 11 39.6	10.097
20	1 44 55.85	2.0657	5 57 42.0	13.205	20	3 23 33.94	2.0616	15 21 42.9	10.014
21	1 46 59.75	2.0644	6 10 52.9	13.157	21	3 25 37.66	2.0625	15 31 41.3	9.931
22	1 49 3.58	2.0630	6 24 0.9	13.109	22	3 27 41.44	2.0634	15 41 34.7	9.848
23	1 51 7.34	2.0621	6 37 6.0	13.059	23	3 29 45.27	2.0643	15 51 23.1	9.764
24	1 53 11.03	2.0610	N. 6 50 8.0	13.008	24	3 31 49.16	2.0653	N. 16 1 6.4	9.679

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	^h 3 ^m 31 ^s 49.16	2.0653	N. 16° 1' 6.4"	9.679	0	^h 5 ^m 12 ^s 23.05	2.1387	N. 21° 58' 42.0"	5.053
1	3 33 53.11	2.0663	16 10 44.6	9.594	1	5 14 30.69	2.1379	22 3 42.0	4.947
2	3 35 57.12	2.0674	16 20 17.7	9.508	2	5 16 38.40	2.1398	22 8 35.6	4.840
3	3 38 1.20	2.0685	16 29 45.6	9.422	3	5 18 46.19	2.1304	22 13 22.8	4.733
4	3 40 5.34	2.0695	16 39 8.3	9.335	4	5 20 54.05	2.1316	22 18 3.6	4.627
5	3 42 9.54	2.0706	16 48 25.8	9.247	5	5 23 1.98	2.1327	22 22 38.0	4.520
6	3 44 13.81	2.0717	16 57 38.0	9.159	6	5 25 9.97	2.1338	22 27 6.0	4.419
7	3 46 18.15	2.0729	17 6 44.9	9.071	7	5 27 18.03	2.1349	22 31 27.5	4.304
8	3 48 22.56	2.0740	17 15 46.5	8.983	8	5 29 26.16	2.1360	22 35 42.5	4.196
9	3 50 27.03	2.0752	17 24 42.8	8.893	9	5 31 34.35	2.1370	22 39 51.0	4.087
10	3 52 31.58	2.0764	17 33 33.7	8.802	10	5 33 42.60	2.1380	22 43 53.0	3.979
11	3 54 36.20	2.0777	17 42 19.1	8.712	11	5 35 50.91	2.1391	22 47 48.5	3.870
12	3 56 40.90	2.0789	17 50 59.1	8.621	12	5 37 59.29	2.1401	22 51 37.4	3.761
13	3 58 45.67	2.0802	17 59 33.6	8.529	13	5 40 7.72	2.1410	22 55 19.8	3.652
14	4 0 50.52	2.0814	18 8 2.6	8.437	14	5 42 16.21	2.1420	22 58 55.6	3.548
15	4 2 55.44	2.0827	18 16 26.1	8.345	15	5 44 24.76	2.1429	23 2 24.8	3.438
16	4 5 0.44	2.0839	18 24 44.0	8.252	16	5 46 33.36	2.1437	23 5 47.5	3.323
17	4 7 5.51	2.0852	18 32 56.3	8.159	17	5 48 42.01	2.1446	23 9 3.6	3.213
18	4 9 10.66	2.0865	18 41 3.1	8.066	18	5 50 50.71	2.1454	23 12 13.0	3.102
19	4 11 15.89	2.0878	18 49 4.2	7.971	19	5 52 59.46	2.1463	23 15 15.8	2.992
20	4 13 21.20	2.0892	18 56 59.6	7.876	20	5 55 8.26	2.1470	23 18 12.0	2.881
21	4 15 26.60	2.0906	19 4 49.3	7.780	21	5 57 17.10	2.1478	23 21 1.5	2.770
22	4 17 32.07	2.0919	19 12 33.2	7.684	22	5 59 25.99	2.1485	23 23 44.4	2.659
23	4 19 37.62	2.0933	N. 19° 20' 11.4"	7.588	23	6 1 34.92	2.1491	N. 23° 26' 20.6"	2.547
WEDNESDAY 26.					FRIDAY 28.				
0	4 21 43.26	2.0947	N. 19° 27' 43.8"	7.491	0	6 3 43.88	2.1497	N. 23° 28' 50.1"	2.436
1	4 23 48.98	2.0960	19 35 10.4	7.394	1	6 5 52.88	2.1503	23 31 12.9	2.324
2	4 25 54.78	2.0973	19 42 31.1	7.297	2	6 8 1.92	2.1509	23 33 29.0	2.213
3	4 28 0.66	2.0987	19 49 46.0	7.199	3	6 10 10.99	2.1514	23 35 38.5	2.101
4	4 30 6.62	2.1001	19 56 55.0	7.101	4	6 12 20.09	2.1519	23 37 41.2	1.989
5	4 32 12.67	2.1015	20 3 58.1	7.003	5	6 14 29.22	2.1524	23 39 37.2	1.877
6	4 34 18.80	2.1029	20 10 55.3	6.903	6	6 16 38.38	2.1528	23 41 26.4	1.764
7	4 36 25.02	2.1043	20 17 46.5	6.803	7	6 18 47.56	2.1533	23 43 8.9	1.652
8	4 38 31.32	2.1057	20 24 31.7	6.703	8	6 20 56.77	2.1537	23 44 44.7	1.540
9	4 40 37.70	2.1070	20 31 10.9	6.603	9	6 23 6.00	2.1540	23 46 13.7	1.427
10	4 42 44.16	2.1083	20 37 44.1	6.502	10	6 25 15.25	2.1542	23 47 36.0	1.315
11	4 44 50.70	2.1097	20 44 11.2	6.401	11	6 27 24.51	2.1544	23 48 51.5	1.202
12	4 46 57.32	2.1110	20 50 32.2	6.299	12	6 29 33.78	2.1546	23 50 0.3	1.090
13	4 49 4.02	2.1124	20 56 47.1	6.197	13	6 31 43.07	2.1548	23 51 2.3	0.977
14	4 51 10.81	2.1138	21 2 55.9	6.095	14	6 33 52.36	2.1549	23 51 57.5	0.864
15	4 53 17.68	2.1152	21 8 58.5	5.993	15	6 36 1.66	2.1551	23 52 46.0	0.751
16	4 55 24.63	2.1165	21 14 55.0	5.890	16	6 38 10.97	2.1552	23 53 27.7	0.638
17	4 57 31.66	2.1178	21 20 45.3	5.786	17	6 40 20.28	2.1552	23 54 2.6	0.526
18	4 59 38.77	2.1192	21 26 29.3	5.682	18	6 42 29.59	2.1552	23 54 30.8	0.413
19	5 1 45.96	2.1205	21 32 7.1	5.578	19	6 44 38.90	2.1551	23 54 52.2	0.300
20	5 3 53.23	2.1217	21 37 38.7	5.474	20	6 46 48.20	2.1550	23 55 6.8	0.187
21	5 6 0.57	2.1230	21 43 4.0	5.369	21	6 48 57.50	2.1549	23 55 14.6	+ 0.074
22	5 8 7.99	2.1242	21 48 23.0	5.264	22	6 51 6.79	2.1547	23 55 15.6	- 0.039
23	5 10 15.48	2.1255	21 53 35.7	5.158	23	6 53 16.06	2.1544	23 55 9.9	0.158
24	5 12 23.05	2.1267	N. 21° 58' 42.0"	5.053	24	6 55 25.32	2.1542	N. 23° 54' 57.4"	0.285

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Pegasi W.	101° 29' 58"	3505	102° 50' 17"	3511	104° 10' 30"	3517	105° 30' 36"	3524
	α Arietis W.	58 35 16	3259	60 0 15	3255	61 25 19	3250	62 50 29	3246
	Aldebaran W.	26 30 54	3109	27 58 53	3106	29 26 55	3104	30 55 0	3102
	Regulus E.	54 6 3	3088	52 37 39	3090	51 9 17	3091	49 40 57	3092
	SATURN E.	57 41 52	3053	56 12 45	3055	54 43 40	3056	53 14 36	3056
	Spica E.	108 5 50	3108	106 37 51	3108	105 9 52	3108	103 41 53	3108
2	α Arietis W.	69 57 27	3226	71 23 5	3223	72 48 47	3220	74 14 33	3215
	Aldebaran W.	38 16 0	3092	39 44 19	3090	41 12 41	3087	42 41 6	3085
	Regulus E.	42 19 31	3095	40 51 15	3096	39 23 0	3096	37 54 45	3096
	SATURN E.	45 49 23	3056	44 20 20	3056	42 51 16	3054	41 22 11	3054
	Spica E.	96 21 53	3104	94 53 49	3103	93 25 45	3102	91 57 39	3101
3	α Arietis W.	81 24 31	3198	82 50 43	3193	84 17 0	3190	85 43 21	3187
	Aldebaran W.	50 3 58	3071	51 32 43	3068	53 1 32	3065	54 30 25	3061
	SATURN E.	33 56 28	3048	32 27 15	3047	30 58 0	3046	29 28 44	3044
	Spica E.	84 36 35	3090	83 8 14	3088	81 39 50	3086	80 11 23	3084
	MARS E.	110 7 7	3251	108 41 58	3248	107 16 46	3245	105 51 30	3242
4	Aldebaran W.	61 55 54	3043	63 25 14	3039	64 54 39	3035	66 24 9	3030
	Spica E.	72 48 17	3068	71 19 28	3065	69 50 35	3062	68 21 38	3059
	MARS E.	98 44 8	3223	97 18 26	3219	95 52 39	3214	94 26 47	3209
	Antares E.	118 42 11	3071	117 13 26	3066	115 44 35	3060	114 15 37	3055
5	Aldebaran W.	73 53 5	3006	75 23 10	3001	76 53 21	2996	78 23 38	2991
	Pollux W.	29 55 32	3061	31 24 29	3051	32 53 38	3049	34 22 59	3039
	Spica E.	60 55 49	3040	59 26 26	3036	57 56 58	3032	56 27 26	3028
	MARS E.	87 16 3	3185	85 49 36	3180	84 23 3	3175	82 56 24	3169
	Antares E.	106 49 17	3029	105 19 41	3024	103 49 59	3019	102 20 10	3014
6	Aldebaran W.	85 56 46	2963	87 27 45	2957	88 58 51	2951	90 30 5	2946
	Pollux W.	41 52 27	2991	43 22 51	2984	44 53 24	2978	46 24 7	2968
	Spica E.	48 58 41	3012	47 28 44	3008	45 58 43	3005	44 28 37	3003
	MARS E.	75 41 26	3140	74 14 5	3134	72 46 37	3128	71 19 1	3121
	Antares E.	94 49 21	2984	93 18 49	2978	91 48 10	2972	90 17 24	2966
7	Pollux W.	54 0 9	2930	55 31 50	2922	57 3 41	2914	58 35 42	2905
	Regulus W.	18 12 22	2997	19 42 39	2978	21 13 19	2961	22 44 20	2946
	Spica E.	36 57 31	2996	35 27 14	2996	33 56 56	2997	32 26 40	2990
	MARS E.	63 58 59	3087	62 30 33	3080	61 1 59	3073	59 33 16	3065
	Antares E.	82 41 33	2935	81 9 59	2928	79 38 16	2921	78 6 24	2914
8	Pollux W.	66 18 24	2865	67 51 28	2856	69 24 43	2846	70 58 9	2838
	Regulus W.	30 23 56	2882	31 56 38	2871	33 29 34	2860	35 2 44	2849
	SATURN W.	27 11 46	2841	28 45 20	2831	30 19 7	2821	31 53 8	2811
	MARS E.	52 7 15	3025	50 37 33	3016	49 7 40	3008	47 37 37	2999
	Antares E.	70 24 52	2879	68 52 6	2872	67 19 10	2864	65 46 4	2856
	α Aquilæ E.	114 28 52	3712	113 12 18	3684	111 55 14	3657	110 37 41	3632
	SUN E.	141 3 28	3236	139 38 1	3226	138 12 23	3216	136 46 33	3206
9	Pollux W.	78 48 17	2792	80 22 55	2782	81 57 46	2772	83 32 50	2762
	Regulus W.	42 52 4	2796	44 26 37	2785	46 1 24	2774	47 36 25	2763

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Pegasi W.	106° 50' 34"	3531	108° 10' 24"	3539	109° 30' 6"	3547	110° 49' 39"	3555
	α Arietis W.	64 15 43	3242	65 41 2	3238	67 6 26	3235	68 31 54	3230
	Aldebaran W.	32 23 7	3100	33 51 16	3098	35 19 28	3096	36 47 43	3094
	Regulus E.	48 12 38	3093	46 44 20	3083	45 16 2	3085	43 47 46	3086
	SATURN E.	51 45 33	3056	50 16 30	3057	48 47 28	3057	47 18 26	3056
	Spica E.	102 13 54	3108	100 45 55	3107	99 17 55	3106	97 49 54	3105
2	α Arietis W.	75 40 24	3212	77 6 19	3208	78 32 19	3204	79 58 23	3201
	Aldebaran W.	44 9 34	3089	45 38 5	3080	47 6 39	3077	48 35 17	3074
	Regulus E.	36 26 31	3096	34 58 17	3096	33 30 3	3097	32 1 50	3097
	SATURN E.	39 53 5	3053	38 23 58	3052	36 54 49	3051	35 25 39	3050
	Spica E.	90 29 31	3099	89 1 20	3097	87 33 8	3095	86 4 53	3093
3	α Arietis W.	87 9 46	3183	88 36 16	3179	90 2 50	3176	91 29 28	3172
	Aldebaran W.	55 59 22	3058	57 28 23	3054	58 57 29	3051	60 26 39	3047
	Regulus E.	27 59 26	3043	26 30 7	3049	25 0 47	3042	23 31 27	3043
	Spica E.	78 42 53	3081	77 14 20	3078	75 45 42	3075	74 17 1	3079
	MARS E.	104 26 10	3238	103 0 46	3235	101 35 18	3231	100 9 45	3227
4	Aldebaran W.	67 53 45	3096	69 23 26	3021	70 53 13	3016	72 23 6	3011
	Spica E.	66 52 37	3055	65 23 32	3051	63 54 22	3048	62 25 7	3044
	MARS E.	93 0 49	3205	91 34 46	3201	90 8 38	3196	88 42 24	3190
	Antares E.	112 46 34	3050	111 17 24	3045	109 48 8	3040	108 18 46	3035
5	Aldebaran W.	79 54 2	2965	81 24 33	2981	82 55 10	2975	84 25 54	2969
	Pollux W.	35 52 32	3094	37 22 15	3015	38 52 9	3007	40 22 13	2999
	Spica E.	54 57 50	3025	53 28 9	3021	51 58 24	3018	50 28 35	3015
	MARS E.	81 29 38	3163	80 2 45	3158	78 35 46	3153	77 8 40	3146
	Antares E.	100 50 14	3008	99 20 12	3002	97 50 2	2996	96 19 45	2990
6	Aldebaran W.	92 1 26	2939	93 32 55	2933	95 4 32	2927	96 36 17	2920
	Pollux W.	47 55 0	2960	49 26 3	2953	50 57 15	2945	52 28 37	2937
	Spica E.	42 58 29	3001	41 28 18	2999	39 58 5	2997	38 27 49	2996
	MARS E.	69 51 17	3114	68 23 25	3108	66 55 25	3101	65 27 16	3094
	Antares E.	88 46 30	2960	87 15 27	2954	85 44 17	2949	84 12 59	2944
7	Pollux W.	60 7 54	2997	61 40 16	2980	63 12 48	2981	64 45 31	2973
	Regulus W.	24 15 41	2931	25 47 20	2918	27 19 16	2905	28 51 28	2893
	Spica E.	30 56 26	3003	29 26 17	3008	27 56 14	3015	26 26 21	3022
	MARS E.	58 4 23	3057	56 35 21	3049	55 6 9	3041	53 36 47	3033
	Antares E.	76 34 24	2907	75 2 14	2900	73 29 56	2893	71 57 28	2886
8	Pollux W.	72 31 47	2929	74 5 37	2920	75 39 38	2911	77 13 51	2901
	Regulus W.	36 36 9	2938	38 9 47	2928	39 43 39	2917	41 17 45	2907
	SATURN W.	33 27 22	2901	35 1 48	2791	36 36 28	2781	38 11 21	2770
	MARS E.	46 7 23	2990	44 36 58	2981	43 6 22	2972	41 35 34	2962
	Antares E.	64 12 49	2848	62 39 24	2841	61 5 48	2833	59 32 3	2825
	α Aquilæ E.	109 19 41	3007	108 1 14	3584	106 42 23	3582	105 23 8	3542
	SUN E.	135 20 31	3195	133 54 16	3185	132 27 49	3174	131 1 9	3163
9	Pollux W.	85 8 7	2752	86 43 38	2741	88 19 23	2731	89 55 22	2720
	Regulus W.	49 11 41	2753	50 47 11	2741	52 22 56	2730	53 58 56	2719

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	SATURN W.	39° 46' 28"	9760	41° 21' 48"	9750	42° 57' 21"	9740	44° 33' 8"	9729
	Antares E.	57 58 6	9817	56 24 0	9809	54 49 43	9801	53 15 15	9793
	α Aquilæ E.	104 3 31	3592	102 43 31	3504	101 23 11	3485	100 2 30	3468
	JUPITER E.	105 57 10	2855	104 23 54	2846	102 50 26	2836	101 16 45	2825
	SUN E.	129 34 15	3152	128 7 9	3141	126 39 49	3130	125 12 16	3119
10	Pollux W.	91 31 35	2710	93 8 2	2698	94 44 45	2686	96 21 43	2675
	Regulus W.	55 35 11	2707	57 11 41	2695	58 48 27	2683	60 25 29	2672
	SATURN W.	52 35 37	2675	54 12 51	2663	55 50 21	2651	57 28 6	2640
	Antares E.	45 20 16	2752	43 44 45	2744	42 9 5	2737	40 33 14	2730
	α Aquilæ E.	93 14 38	3394	91 52 15	3382	90 29 38	3370	89 6 48	3359
	JUPITER E.	93 24 54	2772	91 49 49	2760	90 14 29	2748	88 38 53	2737
	SUN E.	117 51 3	3060	116 22 4	3047	114 52 50	3034	113 23 20	3022
	Regulus W.	68 34 44	2609	70 13 27	2596	71 52 27	2583	73 31 45	2570
11	SATURN W.	65 40 57	2578	67 20 22	2565	69 0 5	2553	70 40 5	2539
	Spica W.	15 49 18	3002	17 19 28	2999	18 51 10	2986	20 24 12	2915
	Antares E.	32 31 54	2704	30 55 20	2701	29 18 42	2700	27 42 3	2704
	JUPITER E.	80 36 56	2675	78 59 43	2662	77 22 12	2649	75 44 24	2635
	α Aquilæ E.	82 9 46	3317	80 45 54	3311	79 21 55	3305	77 57 50	3301
	SUN E.	105 51 51	2956	104 20 43	2942	102 49 17	2928	101 17 33	2914
	Regulus W.	81 52 51	2502	83 34 1	2488	85 15 31	2474	86 57 21	2460
	SATURN W.	79 4 44	2472	80 46 37	2458	82 28 50	2444	84 11 22	2430
12	Spica W.	28 24 14	2625	30 2 33	2598	31 41 30	2574	33 21 1	2551
	JUPITER E.	67 30 47	2567	65 51 7	2553	64 11 8	2539	62 30 40	2525
	α Aquilæ E.	70 56 49	3302	69 32 40	3305	68 8 35	3311	66 44 37	3320
	SUN E.	93 34 22	2841	92 0 47	2826	90 26 53	2811	88 52 39	2796
	Regulus W.	95 31 28	2389	97 15 18	2375	98 59 29	2361	100 44 0	2347
	SATURN W.	92 49 3	2359	94 33 36	2345	96 18 30	2331	98 3 44	2317
	Spica W.	41 46 13	2447	43 28 40	2428	45 11 33	2411	46 54 52	2393
	JUPITER E.	54 4 17	2454	52 21 59	2439	50 39 20	2425	48 56 21	2411
13	α Aquilæ E.	59 48 1	3398	58 25 42	3421	57 3 50	3450	55 42 30	3484
	SUN E.	80 56 33	2719	79 20 19	2704	77 43 45	2689	76 6 51	2675
	Spica W.	55 37 33	2312	56 23 15	2296	58 9 20	2281	60 55 47	2267
	MARS W.	24 28 0	2427	26 10 56	2412	27 54 14	2396	29 37 54	2381
	JUPITER E.	40 16 24	2341	38 31 25	2328	36 46 7	2315	35 0 30	2303
	α Aquilæ E.	49 6 59	3736	47 50 50	3809	46 35 57	3892	45 22 29	3967
	SUN E.	67 57 20	2601	66 18 26	2587	64 39 13	2572	62 59 40	2559
	Spica W.	69 53 14	2200	71 41 42	2188	73 30 28	2176	75 19 33	2165
15	MARS W.	38 21 23	2313	40 7 3	2301	41 53 1	2289	43 39 16	2277
	Antares W.	24 21 10	2394	26 6 34	2295	27 52 41	2269	29 39 26	2245
	SUN E.	54 37 23	2495	52 56 3	2484	51 14 28	2474	49 32 38	2463
	Spica W.	84 28 54	2116	86 19 29	2108	88 10 17	2101	90 1 15	2094
	MARS W.	52 34 36	2227	54 22 23	2219	56 10 22	2211	57 58 33	2204
	Antares W.	38 41 3	2155	40 30 38	2143	42 20 31	2130	44 10 44	2120
	SUN E.	41 0 4	2421	39 16 59	2415	37 33 45	2410	35 50 25	2406
	Spica W.	84 28 54	2116	86 19 29	2108	88 10 17	2101	90 1 15	2094

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	SATURN W.	46 9 9	9719	47 45 24	9707	49 21 54	9697	50 56 36	9686
	Antares E.	51 40 37	9784	50 5 48	9776	48 30 48	9768	46 55 37	9760
	α Aquilæ E.	98 41 30	9459	97 20 13	9436	95 58 37	9491	94 36 45	9408
	JUPITER E.	99 42 50	9815	98 6 42	9804	96 34 20	9794	94 59 44	9783
	SUN E.	123 44 30	3108	122 16 30	3096	120 48 15	3084	119 19 46	3073
10	Pollux W.	97 58 56	9683	99 36 25	9651	101 14 10	9640	102 52 11	9627
	Regulus W.	62 2 47	9660	63 40 21	9647	65 18 12	9635	66 56 19	9622
	SATURN W.	59 6 7	9698	60 44 24	9615	62 22 58	9603	64 1 49	9590
	Antares E.	38 57 15	9793	37 21 6	9716	35 44 49	9711	34 8 24	9707
	α Aquilæ E.	87 43 45	3349	86 20 30	3340	84 57 5	3331	83 33 30	3324
	JUPITER E.	87 3 2	9795	85 26 55	9713	83 50 32	9700	82 13 52	9688
	SUN E.	111 53 35	3009	110 23 34	2996	108 53 16	2983	107 22 42	2970
11	Regulus W.	75 11 21	9557	76 51 15	9543	78 31 28	9530	80 12 0	9516
	SATURN W.	72 20 24	9596	74 1 1	9513	75 41 56	9499	77 23 10	9485
	Spica W.	21 58 27	9706	23 33 26	9791	25 9 38	9687	26 46 35	9657
	Antares E.	26 5 27	9719	24 29 3	9791	22 52 52	9731	21 16 54	9743
	JUPITER E.	74 6 17	9699	72 27 52	9609	70 49 9	9595	69 10 7	9589
	α Aquilæ E.	76 33 42	3399	75 9 30	3396	73 45 16	3393	72 21 2	3389
	SUN E.	99 45 32	2999	98 13 12	2985	96 40 34	2970	95 7 37	2956
12	Regulus W.	88 39 30	9446	90 22 0	9439	92 4 49	9418	93 47 58	9403
	SATURN W.	85 54 14	9416	87 37 26	9409	89 20 58	9398	91 4 50	9373
	Spica W.	35 1 3	9596	36 41 37	9506	38 22 41	9496	40 4 13	9486
	JUPITER E.	60 50 11	2511	59 9 13	9496	57 27 54	9489	55 46 16	9467
	α Aquilæ E.	65 20 49	3330	63 57 12	3343	62 33 50	3356	61 10 46	3376
	SUN E.	87 18 6	9781	85 43 13	9766	84 7 59	9750	82 32 26	9736
13	Regulus W.	102 28 51	9333	103 14 2	9319	105 59 34	9305	107 45 26	9291
	SATURN W.	99 49 19	9303	101 35 14	9299	103 21 30	9275	105 8 6	9261
	Spica W.	48 38 36	9377	50 22 44	9259	52 7 17	9343	53 52 13	9337
	JUPITER E.	47 13 2	9397	45 29 23	9389	43 45 23	9368	42 1 3	9355
	α Aquilæ E.	54 21 48	3599	53 1 48	3564	51 42 35	3615	50 24 17	3671
	SUN E.	74 29 37	2960	72 52 3	9645	71 14 8	9630	69 35 54	9615
14	Spica W.	62 42 35	9253	64 29 44	9236	66 17 14	9224	68 5 4	9211
	MARS W.	31 21 56	9367	33 6 18	9353	34 51 0	9330	36 36 2	9306
	JUPITER E.	33 14 35	2990	31 28 21	9279	29 41 50	9268	27 55 3	9256
	α Aquilæ E.	44 10 37	4095	43 0 31	4918	41 52 22	4360	40 46 24	4521
	SUN E.	61 19 49	2545	59 39 39	9539	57 59 11	9520	56 18 26	9507
15	Spica W.	77 8 54	9154	78 58 31	9144	80 48 24	9134	82 38 32	9124
	MARS W.	45 25 49	9266	47 12 38	9255	48 59 43	9246	50 47 2	9236
	Antares W.	31 26 46	9293	33 14 39	9293	35 3 2	9186	36 51 51	9170
	SUN E.	47 50 33	9453	46 8 14	9444	44 25 42	9436	42 42 58	9428
16	Spica W.	91 52 24	9087	93 43 43	9089	95 35 9	9077	97 26 43	9073
	MARS W.	59 46 55	9197	61 35 27	9191	63 24 8	9186	65 12 57	9181
	Antares W.	46 1 13	9110	47 51 56	9101	49 42 53	9094	51 34 1	9087
	SUN E.	34 6 59	9493	32 23 29	9401	30 39 56	9401	28 56 22	9403

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
17	Spica W.	99 18 24	2070	101 10 9	2008	103 1 59	2066	104 53 52	2065
	Antares W.	53 25 20	2082	55 16 47	2077	57 8 23	2073	59 0 5	2069
	SUN E.	27 12 50	2405	25 29 23	2411	23 46 5	2420	22 2 59	2431
20	SUN W.	15 28 58	2637	17 7 3	2620	18 45 31	2612	20 24 9	2610
	Aldebaran E.	81 17 44	2185	79 28 24	2178	77 39 24	2192	75 50 44	2206
	Pollux E.	125 25 36	2180	123 36 38	2192	121 47 59	2204	119 59 38	2218
21	SUN W.	28 36 22	2647	30 14 13	2660	31 51 46	2675	33 29 0	2690
	Aldebaran E.	66 52 58	2284	65 6 35	2301	63 20 37	2318	61 35 3	2335
	Pollux E.	111 3 9	2292	109 16 58	2308	107 31 10	2325	105 45 47	2341
22	SUN W.	41 29 56	2773	43 4 59	2791	44 39 38	2810	46 13 53	2828
	α Pegasi W.	33 20 34	4143	34 29 54	4014	35 41 20	3904	36 54 36	3810
	Aldebaran E.	52 53 44	2426	51 10 47	2446	49 28 18	2465	47 46 16	2484
	Pollux E.	97 5 1	2430	95 22 9	2448	93 39 42	2466	91 57 41	2484
23	SUN W.	53 59 2	2923	55 30 51	2942	57 2 16	2961	58 33 17	2980
	α Pegasi W.	43 21 8	3510	44 41 21	3475	46 2 13	3445	47 23 39	3418
	Aldebaran E.	39 22 52	2583	37 43 34	2603	36 4 44	2623	34 26 21	2644
	Pollux E.	83 34 3	2577	81 54 36	2596	80 15 35	2614	78 36 59	2632
24	SUN W.	66 2 26	3075	67 31 6	3092	68 59 25	3110	70 27 22	3128
	α Pegasi W.	54 16 40	3344	55 40 1	3337	57 3 30	3332	58 27 5	3329
	Pollux E.	70 30 8	2722	68 53 57	2740	67 18 10	2757	65 42 45	2773
	Regulus E.	106 26 22	2716	104 50 3	2732	103 14 5	2748	101 38 29	2764
25	SUN W.	77 41 54	3211	79 7 50	3227	80 33 27	3242	81 58 46	3257
	α Pegasi W.	65 25 29	3399	66 49 7	3332	68 12 41	3336	69 36 11	3339
	α Arietis W.	22 28 33	3690	23 42 3	3782	24 57 24	3689	26 14 24	3614
	Pollux E.	57 51 4	2853	56 17 45	2869	54 44 46	2884	53 12 7	2898
	Regulus E.	93 45 43	2841	92 12 9	2856	90 38 54	2870	89 5 57	2884
	SATURN E.	95 30 42	2809	93 56 26	2823	92 22 28	2837	90 48 48	2851
26	SUN W.	89 1 11	3325	90 24 54	3337	91 48 23	3349	93 11 38	3359
	α Arietis W.	32 55 6	3403	34 17 19	3380	35 40 0	3359	37 3 3	3342
	Pollux E.	45 33 22	2967	44 2 28	2980	42 31 50	2993	41 1 28	3005
	Regulus E.	81 25 23	2946	79 54 2	2957	78 22 56	2968	76 52 3	2979
	SATURN E.	83 4 43	2912	81 32 40	2924	80 0 52	2935	78 29 17	2945
27	SUN W.	100 4 53	3408	101 27 0	3417	102 48 57	3425	104 10 45	3432
	α Arietis W.	44 2 20	3288	45 26 45	3292	46 51 17	3276	48 15 56	3272
	Pollux E.	33 33 27	3065	32 4 35	3077	30 35 57	3090	29 7 35	3103
	Regulus E.	69 20 45	3024	67 51 2	3031	66 21 28	3039	64 52 3	3046
	SATURN E.	70 54 24	2989	69 23 58	2997	67 53 41	3004	66 23 33	3010
28	SUN W.	110 57 52	3462	112 18 58	3466	113 40 0	3470	115 0 57	3474
	α Arietis W.	55 20 21	3253	56 45 25	3253	58 10 32	3249	59 35 43	3247
	Regulus E.	57 26 56	3074	55 58 14	3078	54 29 37	3082	53 1 5	3086
	SATURN E.	58 54 45	3037	57 25 18	3042	55 55 57	3045	54 26 40	3047
	Spica E.	111 26 23	3094	109 58 6	3097	108 29 53	3099	107 1 44	3102

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
17	Spica	W.	106° 45' 46"	9064	108° 37' 40"	9064	110° 29' 35"	9065	112° 21' 27"	9068
	Antares	W.	60 51 52	9067	62 43 42	9065	64 35 35	9064	66 27 28	9064
	Sun	E.	20 20 10	9447	18 37 42	9470	16 55 47	9504	15 14 40	9552
20	Sun	W.	22 2 50	9613	23 41 27	9618	25 19 57	9696	26 58 16	9636
	Aldebaran	E.	74 2 26	9221	72 14 30	9236	70 26 56	9251	68 39 45	9268
	Pollux	E.	118 11 38	9233	116 23 59	9247	114 36 41	9261	112 49 44	9276
21	Sun	W.	35 5 54	9705	36 42 28	9721	38 18 40	9738	39 54 29	9755
	Aldebaran	E.	59 49 55	9253	58 5 13	9271	56 20 57	9289	54 37 7	9408
	Pollux	E.	104 0 47	9258	102 16 12	9277	100 32 4	9293	98 48 19	9412
22	Sun	W.	47 47 44	9848	49 21 10	9867	50 54 11	9885	52 26 49	9904
	α Pegasi	W.	38 9 28	3729	39 25 44	3692	40 43 12	3603	42 1 43	3554
	Aldebaran	E.	46 4 41	9504	44 23 33	9523	42 42 52	9543	41 2 38	9563
	Pollux	E.	90 16 5	9503	88 34 56	9522	86 54 13	9540	85 13 55	9558
23	Sun	W.	60 3 55	3000	61 34 8	3018	63 3 58	3038	64 33 24	3057
	α Pegasi	W.	48 45 35	3396	50 7 54	3379	51 30 34	3365	52 53 30	3353
	Aldebaran	E.	32 48 26	9663	31 10 57	9683	29 33 57	9703	27 57 21	9725
	Pollux	E.	76 58 48	9651	75 21 2	9669	73 43 40	9687	72 6 42	9704
24	Sun	W.	71 54 57	3146	73 22 11	3163	74 49 5	3179	76 15 39	3195
	α Pegasi	W.	59 50 43	3396	61 14 25	3325	62 38 7	3323	64 1 49	3327
	Pollux	E.	64 7 42	9790	62 33 1	9806	60 56 41	9829	59 24 42	9838
	Regulus	E.	100 3 14	9781	98 28 21	9796	96 53 48	9812	95 19 36	9827
25	Sun	W.	83 23 48	3271	84 48 33	3285	86 13 1	3299	87 37 14	3313
	α Pegasi	W.	70 59 37	3345	72 22 56	3350	73 46 10	3355	75 9 18	3361
	α Arietis	W.	27 32 43	3554	28 52 7	3507	30 12 23	3466	31 33 25	3422
	Pollux	E.	51 39 46	9213	50 7 44	9227	48 35 59	9241	47 4 32	9254
	Regulus	E.	87 33 17	9697	86 0 54	9710	84 28 48	9723	82 56 58	9735
	Saturn	E.	89 15 27	9804	87 42 22	9876	86 9 33	9889	84 37 0	9901
26	Sun	W.	94 34 41	3371	95 57 31	3381	97 20 9	3391	98 42 36	3400
	α Arietis	W.	38 26 26	3398	39 50 5	3315	41 13 59	3306	42 38 4	3296
	Pollux	E.	39 31 22	3017	38 1 30	3030	36 31 54	3042	35 2 33	3054
	Regulus	E.	75 21 24	9289	73 50 57	9298	72 20 42	9307	70 50 38	9316
	Saturn	E.	76 57 55	9254	75 26 45	9264	73 55 47	9274	72 25 0	9282
27	Sun	W.	105 32 25	3439	106 53 57	3446	108 15 22	3452	109 36 40	3457
	α Arietis	W.	49 40 40	3268	51 5 29	3264	52 30 22	3260	53 55 20	3258
	Pollux	E.	27 39 29	3115	26 11 38	3129	24 44 4	3145	23 16 49	3163
	Regulus	E.	63 22 47	3052	61 53 39	3058	60 24 38	3064	58 55 44	3069
	Saturn	E.	64 53 33	3017	63 23 41	3022	61 53 56	3027	60 24 17	3033
28	Sun	W.	116 21 50	3477	117 42 40	3480	119 3 26	3482	120 24 10	3485
	α Arietis	W.	61 0 57	3244	62 26 14	3241	63 51 34	3239	65 16 57	3236
	Regulus	E.	51 32 32	3088	50 4 14	3091	48 35 53	3093	47 7 35	3096
	Saturn	E.	52 57 26	3051	51 28 16	3053	49 59 9	3056	48 30 4	3056
	Spica	E.	105 33 37	3104	104 5 33	3106	102 37 31	3107	101 9 30	3108

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Sat.	1	^h 22 ^m 49 ^s 30.89	9.355	S. 7° 28' 55.7"	+57.03	16' 10.38"	^s 65.41	^m 12 ^s 30.89	^s 0.500
SUN.	2	22 53 15.13	9.334	7 6 3.6	57.29	16 10.14	65.34	12 18.61	0.521
Mon.	3	22 56 58.86	9.313	6 43 5.7	57.53	16 9.89	65.27	12 5.83	0.542
Tues.	4	23 0 42.12	9.294	6 20 2.2	+57.75	16 9.65	65.20	11 52.57	0.561
Wed.	5	23 4 24.92	9.275	5 56 53.6	57.96	16 9.40	65.14	11 38.85	0.560
Thur.	6	23 8 7.29	9.257	5 33 40.2	58.15	16 9.15	65.08	11 24.70	0.597
Frid.	7	23 11 49.25	9.240	5 10 22.4	+58.33	16 8.89	65.02	11 10.15	0.614
Sat.	8	23 15 30.83	9.225	4 47 0.5	58.49	16 8.63	64.96	10 55.22	0.629
SUN.	9	23 19 12.04	9.210	4 23 34.8	58.64	16 8.36	64.91	10 39.91	0.644
Mon.	10	23 22 52.91	9.197	4 0 5.8	+58.77	16 8.09	64.86	10 24.27	0.657
Tues.	11	23 26 33.47	9.184	3 36 33.9	58.89	16 7.82	64.82	10 8.32	0.670
Wed.	12	23 30 13.74	9.172	3 12 59.3	58.99	16 7.55	64.77	9 52.08	0.682
Thur.	13	23 33 53.72	9.161	2 49 22.4	+59.08	16 7.28	64.73	9 35.55	0.693
Frid.	14	23 37 33.45	9.151	2 25 43.5	59.15	16 7.01	64.69	9 18.77	0.703
Sat.	15	23 41 12.95	9.141	2 2 3.2	59.21	16 6.73	64.65	9 1.77	0.713
SUN.	16	23 44 52.24	9.133	1 38 21.7	+59.25	16 6.46	64.62	8 44.55	0.721
Mon.	17	23 48 31.33	9.125	1 14 39.4	59.28	16 6.18	64.59	8 27.14	0.729
Tues.	18	23 52 10.24	9.118	0 50 56.6	59.29	16 5.91	64.56	8 9.54	0.736
Wed.	19	23 55 48.99	9.112	0 27 13.8	+59.28	16 5.63	64.54	7 51.79	0.742
Thur.	20	23 59 27.60	9.106	S. 0 3 31.3	59.26	16 5.36	64.52	7 33.90	0.748
Frid.	21	0 3 6.08	9.101	N. 0 20 10.5	59.22	16 5.08	64.50	7 15.88	0.753
Sat.	22	0 6 44.45	9.097	0 43 51.2	+59.17	16 4.81	64.49	6 57.75	0.757
SUN.	23	0 10 22.74	9.093	1 7 30.4	59.10	16 4.53	64.48	6 39.53	0.761
Mon.	24	0 14 0.95	9.091	1 31 7.8	59.01	16 4.26	64.48	6 21.23	0.763
Tues.	25	0 17 39.10	9.089	1 54 42.9	+58.91	16 3.99	64.47	6 2.87	0.765
Wed.	26	0 21 17.21	9.088	2 18 15.4	58.79	16 3.72	64.47	5 44.48	0.766
Thur.	27	0 24 55.29	9.087	2 41 44.9	58.66	16 3.44	64.47	5 26.06	0.767
Frid.	28	0 28 33.36	9.087	3 5 11.0	+58.51	16 3.17	64.47	5 7.64	0.767
Sat.	29	0 32 11.46	9.088	3 28 33.4	58.35	16 2.90	64.48	4 49.24	0.766
SUN.	30	0 35 49.60	9.090	3 51 51.8	58.17	16 2.63	64.49	4 30.87	0.764
Mon.	31	0 39 27.79	9.093	4 15 5.7	57.98	16 2.35	64.50	4 12.55	0.762
Tues.	32	0 43 6.06	9.096	N. 4 38 14.8	+57.78	16 2.08	64.51	3 54.32	0.758

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.13 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Sat.	1	^h 22 ^m 49 ^s 28.94	9.356	S. [°] 7 ['] 29 ["] 7.6	+57.04	^m 12 ^s 30.99	0.500	^h 22 ^m 36 ^s 57.95
SUN.	2	22 53 13.21	9.335	7 6 15.4	57.30	12 18.71	0.521	22 40 54.50
Mon.	3	22 56 56.98	9.314	6 43 17.3	57.54	12 5.93	0.542	22 44 51.06
Tues.	4	23 0 40.28	9.295	6 20 13.7	+57.76	11 52.67	0.561	22 48 47.61
Wed.	5	23 4 23.12	9.276	5 57 4.9	57.97	11 38.95	0.580	22 52 44.17
Thur.	6	23 8 5.53	9.259	5 33 51.3	58.16	11 24.81	0.597	22 56 40.72
Frid.	7	23 11 47.53	9.242	5 10 33.3	+58.34	11 10.26	0.614	23 0 37.27
Sat.	8	23 15 29.15	9.227	4 47 11.2	58.50	10 55.33	0.629	23 4 33.82
SUN.	9	23 19 10.40	9.212	4 23 45.3	58.65	10 40.02	0.644	23 8 30.38
Mon.	10	23 22 51.31	9.199	4 0 16.1	+58.78	10 24.38	0.657	23 12 26.93
Tues.	11	23 26 31.91	9.186	3 36 43.9	58.90	10 8.43	0.670	23 16 23.48
Wed.	12	23 30 12.22	9.174	3 13 9.1	59.00	9 52.19	0.682	23 20 20.03
Thur.	13	23 33 52.25	9.163	2 49 31.9	+59.09	9 35.66	0.693	23 24 16.59
Frid.	14	23 37 32.02	9.153	2 25 52.8	59.16	9 18.88	0.703	23 28 13.14
Sat.	15	23 41 11.57	9.144	2 2 12.2	59.22	9 1.88	0.713	23 32 9.69
SUN.	16	23 44 50.90	9.135	1 38 30.4	+59.26	8 44.66	0.721	23 36 6.24
Mon.	17	23 48 30.04	9.127	1 14 47.8	59.29	8 27.24	0.729	23 40 2.80
Tues.	18	23 52 8.99	9.120	0 51 4.7	59.30	8 9.64	0.736	23 43 59.35
Wed.	19	23 55 47.79	9.114	0 27 21.6	+59.29	7 51.89	0.742	23 47 55.90
Thur.	20	23 59 26.45	9.108	S. 0 3 38.8	59.27	7 34.00	0.748	23 51 52.45
Frid.	21	0 3 4.98	9.103	N. 0 20 3.3	59.23	7 15.97	0.753	23 55 49.01
Sat.	22	0 6 43.40	9.099	0 43 44.3	+59.18	6 57.84	0.757	23 59 45.56
SUN.	23	0 10 21.73	9.095	1 7 23.8	59.11	6 39.61	0.761	0 3 42.12
Mon.	24	0 13 59.98	9.093	1 31 1.5	59.02	6 21.31	0.763	0 7 38.67
Tues.	25	0 17 38.17	9.091	1 54 37.0	+58.92	6 2.95	0.765	0 11 35.22
Wed.	26	0 21 16.33	9.090	2 18 9.8	58.80	5 44.56	0.766	0 15 31.77
Thur.	27	0 24 54.46	9.089	2 41 39.6	58.67	5 26.13	0.767	0 19 28.33
Frid.	28	0 28 32.58	9.089	3 5 6.0	+58.52	5 7.70	0.767	0 23 24.88
Sat.	29	0 32 10.73	9.090	3 28 28.7	58.36	4 49.30	0.766	0 27 21.43
SUN.	30	0 35 48.91	9.092	3 51 47.4	58.18	4 30.93	0.764	0 31 17.98
Mon.	31	0 39 27.15	9.094	4 15 1.6	57.99	4 12.61	0.762	0 35 14.54
Tues.	32	0 43 5.46	9.098	N. 4 38 11.0	+57.79	3 54.37	0.758	0 39 11.09

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
 The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour,
 +9°.8565.
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	60	340° 53' 58.3	54' 6.6	150.37	+ 0.35	9.9962348	+44.6	^h 1 ^m 22 ^s 48.45
2	61	341 54 6.2	54 14.4	150.20	0.48	9.9963425	45.2	1 18 52.54
3	62	342 54 12.1	54 20.2	150.20	0.60	9.9964517	45.8	1 14 56.63
4	63	343 54 16.0	54 24.0	150.12	+ 0.69	9.9965624	+46.4	1 11 0.72
5	64	344 54 17.9	54 25.8	150.04	0.76	9.9966745	47.0	1 7 4.82
6	65	345 54 17.9	54 25.7	149.96	0.81	9.9967882	47.6	1 3 8.92
7	66	346 54 16.0	54 23.7	149.88	+ 0.82	9.9969034	+48.3	0 59 13.01
8	67	347 54 12.3	54 19.9	149.80	0.80	9.9970201	48.9	0 55 17.10
9	68	348 54 6.8	54 14.3	149.73	0.75	9.9971381	49.4	0 51 21.19
10	69	349 53 59.5	54 6.9	149.65	+ 0.67	9.9972574	+49.9	0 47 25.28
11	70	350 53 50.4	53 57.7	149.58	0.57	9.9973779	50.4	0 43 29.37
12	71	351 53 39.6	53 46.8	149.51	0.45	9.9974994	50.8	0 39 33.46
13	72	352 53 27.2	53 34.3	149.45	+ 0.32	9.9976217	+51.1	0 35 37.56
14	73	353 53 13.2	53 20.2	149.38	0.19	9.9977447	51.3	0 31 41.65
15	74	354 52 57.4	53 4.3	149.31	+ 0.06	9.9978682	51.5	0 27 45.74
16	75	355 52 39.9	52 46.7	149.24	- 0.06	9.9979921	+51.6	0 23 49.83
17	76	356 52 20.6	52 27.3	149.16	0.17	9.9981162	51.7	0 19 53.93
18	77	357 51 59.6	52 6.2	149.08	0.26	9.9982403	51.7	0 15 58.02
19	78	358 51 36.7	51 43.2	149.00	- 0.32	9.9983644	+51.7	0 12 2.12
20	79	359 51 11.8	51 18.2	148.92	0.35	9.9984883	51.6	0 8 6.22
21	80	0 50 44.9	50 51.2	148.83	0.36	9.9986120	51.5	0 4 10.31
22	81	1 50 16.0	50 22.2	148.75	- 0.34	9.9987355	+51.4	0 0 14.40
23	82	2 49 44.9	49 51.0	148.66	0.28	9.9988586	51.2	23 56 18.49
24	83	3 49 11.6	49 17.6	148.57	0.19	9.9989814	51.1	23 52 22.58
25	84	4 48 36.1	48 42.0	148.48	- 0.07	9.9991041	+51.1	23 48 26.68
26	85	5 47 58.3	48 4.1	148.38	+ 0.05	9.9992266	51.0	23 44 30.77
27	86	6 47 18.2	47 23.9	148.28	0.18	9.9993490	51.0	23 40 34.86
28	87	7 46 35.7	46 41.3	148.18	+ 0.31	9.9994713	+51.0	23 36 38.95
29	88	8 45 50.9	45 56.4	148.08	0.44	9.9995938	51.1	23 32 43.05
30	89	9 45 3.8	45 9.2	147.98	0.55	9.9997165	51.2	23 28 47.14
31	90	10 44 14.3	44 19.7	147.89	0.65	9.9998394	51.3	23 24 51.23
32	91	11 43 22.6	43 27.9	147.80	+ 0.73	9.9999626	+51.4	23 20 55.33
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .								
								Diff. for 1 Hour. — 9 ^h .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	14 46.7	14 46.2	54 7.1	-0.23	54 5.5	-0.05	8 35.5	2.05	10.1
2	14 46.3	14 47.0	54 5.9	+0.13	54 8.5	+0.29	9 24.5	2.02	11.1
3	14 48.2	14 49.9	54 12.9	0.43	54 18.9	0.57	10 12.6	1.97	12.1
4	14 51.9	14 54.4	54 26.5	+0.69	54 35.5	+0.80	10 59.3	1.92	13.1
5	14 57.1	15 0.2	54 45.6	0.88	54 56.7	0.96	11 44.8	1.87	14.1
6	15 3.4	15 6.9	55 8.7	1.03	55 21.3	1.08	12 29.2	1.84	15.1
7	15 10.4	15 14.2	55 34.5	+1.12	55 48.2	+1.16	13 13.0	1.83	16.1
8	15 18.0	15 21.9	56 2.3	1.19	56 16.7	1.21	13 57.1	1.86	17.1
9	15 25.9	15 30.0	56 31.3	1.23	56 46.2	1.25	14 42.3	1.92	18.1
10	15 34.1	15 38.2	57 1.2	+1.26	57 16.4	+1.28	15 29.4	2.02	19.1
11	15 42.4	15 46.6	57 31.8	1.28	57 47.2	1.29	16 19.4	2.14	20.1
12	15 50.8	15 55.0	58 2.7	1.29	58 18.1	1.28	17 13.1	2.28	21.1
13	15 59.1	16 3.2	58 33.3	+1.26	58 48.2	+1.22	18 10.2	2.42	22.1
14	16 7.1	16 10.8	59 2.6	1.17	59 16.2	1.09	19 9.9	2.52	23.1
15	16 14.2	16 17.2	59 28.7	0.98	59 39.7	0.85	20 11.0	2.53	24.1
16	16 19.8	16 21.8	59 49.1	+0.70	59 56.4	+0.50	21 11.4	2.47	25.1
17	16 23.1	16 23.7	60 1.2	+0.28	60 3.4	+0.05	22 9.6	2.36	26.1
18	16 23.4	16 22.4	60 2.6	-0.20	59 58.6	-0.46	23 4.8	2.24	27.1
19	16 20.4	16 17.6	59 51.5	-0.73	59 41.1	-0.99	23 57.0	2.13	28.1
20	16 14.0	16 9.6	59 27.8	1.23	59 11.6	1.44	δ		29.1
21	16 4.5	15 58.9	58 53.0	1.64	58 32.3	1.79	0 46.9	2.05	0.6
22	15 52.8	15 46.4	58 10.0	-1.90	57 46.7	-1.97	1 35.5	2.01	1.6
23	15 39.9	15 33.3	57 22.7	2.01	56 58.6	1.98	2 23.2	1.99	2.6
24	15 26.9	15 20.7	56 35.0	1.94	56 12.2	1.85	3 11.1	2.01	3.6
25	15 14.8	15 9.4	55 50.6	-1.73	55 30.5	-1.59	3 59.6	2.06	4.6
26	15 4.4	15 0.1	55 12.4	1.42	54 56.5	1.21	4 48.9	2.06	5.6
27	14 56.4	14 53.3	54 42.8	1.04	54 31.6	0.98	5 38.6	2.07	6.6
28	14 51.0	14 49.3	54 22.9	-0.61	54 16.9	-0.40	6 28.5	2.07	7.6
29	14 48.4	14 48.1	54 13.4	-0.18	54 12.5	+0.03	7 18.0	2.04	8.6
30	14 48.6	14 49.7	54 14.2	+0.24	54 18.2	0.43	8 6.4	1.99	9.6
31	14 51.4	14 53.7	54 24.6	0.62	54 33.0	0.78	8 53.6	1.94	10.6
32	14 56.5	14 59.8	54 43.4	+0.94	54 55.5	+1.07	9 39.4	1.89	11.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	6 55 25.32	2.1542	N. 23° 54' 57.4"	0.365	0	8 37 47.60	2.0961	N. 21° 35' 4.9"	5.467
1	6 57 34.57	2.1539	23 54 38.1	0.377	1	8 39 53.43	2.0962	21 29 33.8	5.568
2	6 59 43.79	2.1535	23 54 12.1	0.490	2	8 41 59.14	2.0942	21 23 56.7	5.668
3	7 1 52.99	2.1532	23 53 39.3	0.603	3	8 44 4.73	2.0922	21 18 13.6	5.768
4	7 4 2.17	2.1527	23 52 59.7	0.716	4	8 46 10.21	2.0903	21 12 24.5	5.867
5	7 6 11.32	2.1522	23 52 13.4	0.828	5	8 48 15.57	2.0883	21 6 29.5	5.967
6	7 8 20.44	2.1517	23 51 20.4	0.940	6	8 50 20.81	2.0863	21 0 28.5	6.066
7	7 10 29.53	2.1512	23 50 20.6	1.052	7	8 52 25.93	2.0843	20 54 21.6	6.163
8	7 12 38.59	2.1507	23 49 14.1	1.164	8	8 54 30.93	2.0822	20 48 8.9	6.260
9	7 14 47.61	2.1501	23 48 0.9	1.276	9	8 56 35.80	2.0802	20 41 50.4	6.357
10	7 16 56.60	2.1494	23 46 41.0	1.388	10	8 58 40.55	2.0782	20 35 26.1	6.453
11	7 19 5.54	2.1487	23 45 14.3	1.501	11	9 0 45.18	2.0761	20 28 56.1	6.548
12	7 21 14.44	2.1479	23 43 40.9	1.612	12	9 2 49.68	2.0740	20 22 20.3	6.644
13	7 23 23.29	2.1472	23 42 0.8	1.724	13	9 4 54.06	2.0719	20 15 38.8	6.739
14	7 25 32.10	2.1464	23 40 14.0	1.835	14	9 6 58.31	2.0698	20 8 51.6	6.834
15	7 27 40.86	2.1455	23 38 20.6	1.946	15	9 9 2.44	2.0677	20 1 58.7	6.928
16	7 29 49.56	2.1446	23 36 20.5	2.057	16	9 11 6.44	2.0656	19 55 0.2	7.021
17	7 31 58.21	2.1437	23 34 13.8	2.167	17	9 13 10.31	2.0634	19 47 56.2	7.113
18	7 34 6.80	2.1427	23 32 0.4	2.278	18	9 15 14.05	2.0612	19 40 46.7	7.205
19	7 36 15.33	2.1417	23 29 40.4	2.388	19	9 17 17.66	2.0591	19 33 31.6	7.297
20	7 38 23.80	2.1407	23 27 13.8	2.490	20	9 19 21.14	2.0569	19 26 11.0	7.388
21	7 40 32.21	2.1396	23 24 40.5	2.610	21	9 21 24.49	2.0548	19 18 45.0	7.478
22	7 42 40.55	2.1384	23 22 0.6	2.719	22	9 23 27.72	2.0527	19 11 13.6	7.568
23	7 44 48.82	2.1373	N. 23 19 14.2	2.828	23	9 25 30.82	2.0506	N. 19 3 36.8	7.658
SUNDAY 2.					TUESDAY 4.				
0	7 46 57.02	2.1361	N. 23 16 21.2	2.938	0	9 27 33.79	2.0484	N. 18 55 54.6	7.747
1	7 49 5.15	2.1348	23 13 21.6	3.047	1	9 29 36.63	2.0462	18 48 7.1	7.835
2	7 51 13.20	2.1336	23 10 15.5	3.156	2	9 31 39.34	2.0440	18 40 14.4	7.923
3	7 53 21.18	2.1323	23 7 2.9	3.264	3	9 33 41.91	2.0418	18 32 16.4	8.010
4	7 55 29.08	2.1310	23 3 43.8	3.373	4	9 35 44.35	2.0397	18 24 13.2	8.096
5	7 57 36.90	2.1296	23 0 18.2	3.481	5	9 37 46.67	2.0376	18 16 4.9	8.182
6	7 59 44.63	2.1282	22 56 46.1	3.588	6	9 39 48.86	2.0354	18 7 51.4	8.267
7	8 1 52.28	2.1267	22 53 7.6	3.696	7	9 41 50.92	2.0332	17 59 32.8	8.352
8	8 3 59.84	2.1253	22 49 22.6	3.803	8	9 43 52.85	2.0311	17 51 9.2	8.436
9	8 6 7.32	2.1239	22 45 31.2	3.910	9	9 45 54.65	2.0289	17 42 40.5	8.519
10	8 8 14.71	2.1223	22 41 33.4	4.016	10	9 47 56.32	2.0268	17 34 6.9	8.602
11	8 10 22.00	2.1206	22 37 29.3	4.122	11	9 49 57.86	2.0247	17 25 28.3	8.684
12	8 12 29.19	2.1190	22 33 18.8	4.227	12	9 51 59.28	2.0226	17 16 44.8	8.765
13	8 14 36.29	2.1175	22 29 2.0	4.332	13	9 54 0.57	2.0204	17 7 56.5	8.846
14	8 16 43.29	2.1159	22 24 38.9	4.438	14	9 56 1.73	2.0183	16 59 3.3	8.927
15	8 18 50.20	2.1142	22 20 9.4	4.543	15	9 58 2.76	2.0162	16 50 5.3	9.006
16	8 20 57.00	2.1125	22 15 33.7	4.648	16	10 0 3.67	2.0142	16 41 2.6	9.084
17	8 23 3.70	2.1108	22 10 51.7	4.752	17	10 2 4.46	2.0121	16 31 55.2	9.162
18	8 25 10.30	2.1091	22 6 3.5	4.855	18	10 4 5.12	2.0100	16 22 43.1	9.240
19	8 27 16.79	2.1073	22 1 9.1	4.958	19	10 6 5.66	2.0080	16 13 26.4	9.317
20	8 29 23.17	2.1054	21 56 8.5	5.061	20	10 8 6.08	2.0059	16 4 5.1	9.393
21	8 31 29.44	2.1036	21 51 1.8	5.164	21	10 10 6.37	2.0038	15 54 39.2	9.469
22	8 33 35.61	2.1018	21 45 48.9	5.268	22	10 12 6.54	2.0019	15 45 8.8	9.543
23	8 35 41.66	2.0999	21 40 29.9	5.367	23	10 14 6.60	2.0000	15 35 34.0	9.617
24	8 37 47.60	2.0981	N. 21 35 4.9	5.467	24	10 16 6.54	1.9980	N. 15 25 54.7	9.691

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
0	^h 10 ^m 16 ^s 6.54	1.9980	N. 15° 25' 54.7"	9.691	0	^h 11 ^m 50 ^s 14.68	1.9374	N. 6° 30' 5.7"	12.330
1	10 18 6.36	1.9980	15 16 11.0	9.764	1	11 52 10.91	1.9371	6 17 44.3	12.374
2	10 20 6.06	1.9941	15 6 23.0	9.835	2	11 54 7.13	1.9368	6 5 20.8	12.409
3	10 22 5.65	1.9992	14 56 30.8	9.906	3	11 56 3.33	1.9366	5 52 55.2	12.443
4	10 24 5.12	1.9903	14 46 34.3	9.977	4	11 57 59.52	1.9364	5 40 27.6	12.476
5	10 26 4.48	1.9884	14 36 33.5	10.048	5	11 59 55.70	1.9363	5 27 58.1	12.507
6	10 28 3.73	1.9866	14 26 28.5	10.117	6	12 1 51.88	1.9362	5 15 26.7	12.538
7	10 30 2.87	1.9847	14 16 19.4	10.185	7	12 3 48.05	1.9362	5 2 53.5	12.569
8	10 32 1.90	1.9829	14 6 6.3	10.253	8	12 5 44.22	1.9363	4 50 18.4	12.600
9	10 34 0.82	1.9812	13 55 49.1	10.320	9	12 7 40.40	1.9364	4 37 41.5	12.629
10	10 35 59.64	1.9795	13 45 27.9	10.386	10	12 9 36.59	1.9365	4 25 2.9	12.657
11	10 37 58.36	1.9777	13 35 2.8	10.452	11	12 11 32.78	1.9366	4 12 22.7	12.683
12	10 39 56.97	1.9760	13 24 33.7	10.516	12	12 13 28.98	1.9368	3 59 40.9	12.709
13	10 41 55.48	1.9743	13 14 0.8	10.580	13	12 15 25.20	1.9371	3 46 57.6	12.735
14	10 43 53.89	1.9727	13 3 24.1	10.644	14	12 17 21.44	1.9374	3 34 12.7	12.760
15	10 45 52.20	1.9711	12 52 43.5	10.707	15	12 19 17.69	1.9377	3 21 26.4	12.783
16	10 47 50.42	1.9695	12 41 59.2	10.769	16	12 21 13.97	1.9380	3 8 38.7	12.806
17	10 49 48.54	1.9679	12 31 11.2	10.830	17	12 23 10.28	1.9387	2 55 49.7	12.827
18	10 51 46.57	1.9664	12 20 19.6	10.890	18	12 25 6.62	1.9392	2 42 59.5	12.847
19	10 53 44.51	1.9649	12 9 24.4	10.950	19	12 27 2.99	1.9396	2 30 8.1	12.867
20	10 55 42.36	1.9634	11 58 25.6	11.009	20	12 28 59.40	1.9405	2 17 15.4	12.887
21	10 57 40.12	1.9620	11 47 23.3	11.067	21	12 30 55.85	1.9412	2 4 21.6	12.906
22	10 59 37.80	1.9606	11 36 17.6	11.124	22	12 32 52.34	1.9419	1 51 26.7	12.923
23	11 1 35.39	1.9592	N. 11° 25' 8.4"	11.181	23	12 34 48.88	1.9427	N. 1° 38' 30.8"	12.939
THURSDAY 6.					SATURDAY 8.				
0	11 3 32.90	1.9579	N. 11° 13' 55.8"	11.237	0	12 36 45.47	1.9436	N. 1° 25' 34.0"	12.954
1	11 5 30.33	1.9566	11 2 39.9	11.292	1	12 38 42.11	1.9445	1 12 36.3	12.969
2	11 7 27.69	1.9553	10 51 20.8	11.346	2	12 40 38.81	1.9455	0 59 37.7	12.983
3	11 9 24.97	1.9541	10 39 58.4	11.400	3	12 42 35.57	1.9466	0 46 38.3	12.996
4	11 11 22.18	1.9529	10 28 32.8	11.452	4	12 44 32.40	1.9477	0 33 38.2	13.007
5	11 13 19.32	1.9517	10 17 4.1	11.504	5	12 46 29.29	1.9488	0 20 37.4	13.017
6	11 15 16.39	1.9506	10 5 32.3	11.556	6	12 48 26.25	1.9500	N. 0° 7' 36.1"	13.027
7	11 17 13.39	1.9495	9 53 57.4	11.607	7	12 50 23.29	1.9512	0 5 25.8	13.037
8	11 19 10.33	1.9485	9 42 19.5	11.656	8	12 52 20.40	1.9525	0 18 28.3	13.045
9	11 21 7.21	1.9475	9 30 38.7	11.704	9	12 54 17.59	1.9539	0 31 31.2	13.052
10	11 23 4.03	1.9466	9 18 55.0	11.751	10	12 56 14.87	1.9553	0 44 34.5	13.058
11	11 25 0.79	1.9456	9 7 8.5	11.798	11	12 58 12.23	1.9567	0 57 38.1	13.063
12	11 26 57.50	1.9447	8 55 19.2	11.845	12	13 0 9.68	1.9583	1 10 42.1	13.068
13	11 28 54.15	1.9438	8 43 27.1	11.891	13	13 2 7.23	1.9600	1 23 46.3	13.071
14	11 30 50.75	1.9430	8 31 32.3	11.936	14	13 4 4.88	1.9616	1 36 50.6	13.073
15	11 32 47.31	1.9423	8 19 34.8	11.980	15	13 6 2.62	1.9633	1 49 55.0	13.074
16	11 34 43.83	1.9417	8 7 34.7	12.023	16	13 8 0.47	1.9651	2 2 59.5	13.075
17	11 36 40.31	1.9410	7 55 32.0	12.066	17	13 9 58.43	1.9670	2 16 4.0	13.074
18	11 38 36.75	1.9403	7 43 26.8	12.107	18	13 11 56.51	1.9689	2 29 8.4	13.072
19	11 40 33.15	1.9397	7 31 19.2	12.147	19	13 13 54.70	1.9708	2 42 12.7	13.070
20	11 42 29.52	1.9391	7 19 9.1	12.187	20	13 15 53.01	1.9727	2 55 16.8	13.066
21	11 44 25.85	1.9386	7 6 56.7	12.226	21	13 17 51.43	1.9748	3 8 20.6	13.061
22	11 46 22.15	1.9382	6 54 42.0	12.264	22	13 19 49.98	1.9770	3 21 24.1	13.056
23	11 48 18.43	1.9377	6 42 25.0	12.302	23	13 21 48.67	1.9792	3 34 27.3	13.050
24	11 50 14.68	1.9374	N. 6° 30' 5.7"	12.339	24	13 23 47.49	1.9814	S. 3° 47' 30.1"	13.044

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	13 23 47.49	1.9814	S. 3 47 30.1	13.042	0	15 2 36.16	2.1573	S. 13 44 27.7	11.397
1	13 25 46.44	1.9837	4 0 32.4	13.033	1	15 4 45.75	2.1623	13 55 49.7	11.334
2	13 27 45.53	1.9861	4 13 34.1	13.023	2	15 6 55.64	2.1673	14 7 7.8	11.969
3	13 29 44.77	1.9885	4 26 35.2	13.013	3	15 9 5.83	2.1723	14 18 22.0	11.904
4	13 31 44.15	1.9910	4 39 35.7	13.002	4	15 11 16.32	2.1773	14 29 32.3	11.137
5	13 33 43.69	1.9936	4 52 35.4	12.989	5	15 13 27.11	2.1824	14 40 38.5	11.069
6	13 35 43.38	1.9962	5 5 34.3	12.975	6	15 15 38.21	2.1876	14 51 40.6	11.000
7	13 37 43.23	1.9988	5 18 32.4	12.961	7	15 17 49.63	2.1929	15 2 38.5	10.929
8	13 39 43.24	2.0015	5 31 29.6	12.944	8	15 20 1.36	2.1981	15 13 32.1	10.857
9	13 41 43.41	2.0043	5 44 25.7	12.927	9	15 22 13.40	2.2033	15 24 21.4	10.784
10	13 43 43.75	2.0072	5 57 20.8	12.909	10	15 24 25.76	2.2087	15 35 6.2	10.709
11	13 45 44.27	2.0101	6 10 14.8	12.890	11	15 26 38.44	2.2141	15 45 46.5	10.633
12	13 47 44.96	2.0130	6 23 7.6	12.870	12	15 28 51.45	2.2195	15 56 22.2	10.557
13	13 49 45.83	2.0160	6 35 59.2	12.849	13	15 31 4.78	2.2249	16 6 53.3	10.478
14	13 51 46.88	2.0191	6 48 49.5	12.827	14	15 33 18.44	2.2303	16 17 19.6	10.398
15	13 53 48.12	2.0222	7 1 38.4	12.803	15	15 35 32.42	2.2357	16 27 41.1	10.317
16	13 55 49.55	2.0254	7 14 25.9	12.779	16	15 37 46.73	2.2412	16 37 57.7	10.235
17	13 57 51.17	2.0287	7 27 11.9	12.754	17	15 40 1.37	2.2467	16 48 9.3	10.151
18	13 59 52.99	2.0320	7 39 56.4	12.727	18	15 42 16.34	2.2522	16 58 15.8	10.066
19	14 1 55.01	2.0354	7 52 39.2	12.699	19	15 44 31.64	2.2578	17 8 17.2	9.980
20	14 3 57.24	2.0388	8 5 20.3	12.671	20	15 46 47.28	2.2635	17 18 13.4	9.892
21	14 5 59.67	2.0422	8 17 59.7	12.642	21	15 49 3.26	2.2691	17 28 4.3	9.803
22	14 8 2.31	2.0458	8 30 37.3	12.611	22	15 51 19.58	2.2747	17 37 49.8	9.713
23	14 10 5.17	2.0495	S. 8 43 13.0	12.578	23	15 53 36.23	2.2803	S. 17 47 29.9	9.622
MONDAY 10.					WEDNESDAY 12.				
0	14 12 8.25	2.0532	S. 8 55 46.7	12.545	0	15 55 53.22	2.2860	S. 17 57 4.4	9.536
1	14 14 11.55	2.0569	9 8 18.4	12.511	1	15 58 10.55	2.2917	18 6 33.3	9.434
2	14 16 15.08	2.0606	9 20 48.0	12.475	2	16 0 28.22	2.2974	18 15 56.5	9.339
3	14 18 18.83	2.0644	9 33 15.4	12.438	3	16 2 46.24	2.3031	18 25 14.0	9.242
4	14 20 22.81	2.0683	9 45 40.6	12.401	4	16 5 4.60	2.3088	18 34 25.6	9.144
5	14 22 27.03	2.0723	9 58 3.5	12.363	5	16 7 23.30	2.3145	18 43 31.3	9.045
6	14 24 31.49	2.0763	10 10 24.0	12.322	6	16 9 42.34	2.3202	18 52 31.0	8.944
7	14 26 36.19	2.0804	10 22 42.1	12.281	7	16 12 1.73	2.3260	19 1 24.6	8.842
8	14 28 41.14	2.0845	10 34 57.7	12.238	8	16 14 21.46	2.3317	19 10 12.0	8.738
9	14 30 46.33	2.0886	10 47 10.7	12.195	9	16 16 41.53	2.3374	19 18 53.1	8.633
10	14 32 51.77	2.0928	10 59 21.1	12.150	10	16 19 1.95	2.3432	19 27 27.9	8.527
11	14 34 57.47	2.0971	11 11 28.7	12.104	11	16 21 22.71	2.3489	19 35 56.3	8.419
12	14 37 3.43	2.1015	11 23 33.5	12.057	12	16 23 43.82	2.3546	19 44 18.2	8.311
13	14 39 9.65	2.1058	11 35 35.5	12.009	13	16 26 5.27	2.3603	19 52 33.6	8.201
14	14 41 16.13	2.1102	11 47 34.6	11.960	14	16 28 27.06	2.3660	20 0 42.3	8.088
15	14 43 22.88	2.1147	11 59 30.7	11.908	15	16 30 49.19	2.3717	20 8 44.2	7.975
16	14 45 29.90	2.1193	12 11 23.6	11.856	16	16 33 11.66	2.3774	20 16 39.3	7.862
17	14 47 37.20	2.1239	12 23 13.4	11.803	17	16 35 34.47	2.3831	20 24 27.6	7.747
18	14 49 44.77	2.1285	12 35 0.0	11.750	18	16 37 57.63	2.3888	20 32 8.9	7.629
19	14 51 52.62	2.1332	12 46 43.4	11.694	19	16 40 21.13	2.3944	20 39 43.1	7.511
20	14 54 0.75	2.1379	12 58 23.3	11.636	20	16 42 44.96	2.3999	20 47 10.2	7.392
21	14 56 9.17	2.1427	13 9 59.7	11.578	21	16 45 9.12	2.4054	20 54 30.2	7.273
22	14 58 17.87	2.1475	13 21 32.6	11.519	22	16 47 33.61	2.4109	21 1 42.9	7.151
23	15 0 26.87	2.1524	13 33 2.0	11.459	23	16 49 58.43	2.4164	21 8 48.3	7.028
24	15 2 36.16	2.1573	S. 13 44 27.7	11.397	24	16 52 23.58	2.4219	S. 21 15 46.3	6.904

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	^h 16 ^m 52 ^s 23.58	2.4919	S. 21° 15' 46.3	6.904	0	^h 18 ^m 53 ^s 48.68	2.6038	S. 24° 3' 14.8	0.957
1	16 54 49.06	2.4974	21 22 36.8	6.778	1	18 56 24.95	2.6052	24 2 54.4	0.493
2	16 57 14.87	2.4982	21 29 19.7	6.651	2	18 59 1.30	2.6064	24 2 24.0	0.589
3	16 59 41.00	2.4982	21 35 54.9	6.522	3	19 1 37.72	2.6075	24 1 43.7	0.755
4	17 2 7.45	2.4935	21 42 22.4	6.393	4	19 4 14.20	2.6084	24 0 53.4	0.921
5	17 4 34.22	2.4988	21 48 42.1	6.263	5	19 6 50.73	2.6092	23 59 53.2	1.087
6	17 7 1.31	2.4541	21 54 54.0	6.132	6	19 9 27.30	2.6099	23 58 43.0	1.253
7	17 9 28.71	2.4592	22 0 57.9	5.999	7	19 12 3.91	2.6105	23 57 22.8	1.420
8	17 11 56.42	2.4643	22 6 53.8	5.865	8	19 14 40.56	2.6111	23 55 52.6	1.587
9	17 14 24.43	2.4694	22 12 41.7	5.730	9	19 17 17.24	2.6114	23 54 12.4	1.753
10	17 16 52.75	2.4745	22 18 21.4	5.593	10	19 19 53.93	2.6115	23 52 22.2	1.920
11	17 19 21.37	2.4795	22 23 52.9	5.456	11	19 22 30.62	2.6115	23 50 22.0	2.086
12	17 21 50.29	2.4844	22 29 16.1	5.317	12	19 25 7.31	2.6114	23 48 11.9	2.252
13	17 24 19.50	2.4893	22 34 30.9	5.177	13	19 27 43.99	2.6112	23 45 51.8	2.418
14	17 26 49.00	2.4941	22 39 37.3	5.037	14	19 30 20.66	2.6110	23 43 21.7	2.584
15	17 29 18.79	2.4988	22 44 35.3	4.896	15	19 32 57.31	2.6106	23 40 41.7	2.750
16	17 31 48.86	2.5034	22 49 24.8	4.753	16	19 35 33.93	2.6100	23 37 51.7	2.916
17	17 34 19.20	2.5079	22 54 5.7	4.609	17	19 38 10.51	2.6093	23 34 51.8	3.081
18	17 36 49.81	2.5124	22 58 37.9	4.464	18	19 40 47.05	2.6086	23 31 42.0	3.246
19	17 39 20.69	2.5169	23 3 1.4	4.318	19	19 43 23.54	2.6077	23 28 22.3	3.410
20	17 41 51.84	2.5213	23 7 16.1	4.171	20	19 45 59.97	2.6066	23 24 52.8	3.574
21	17 44 23.25	2.5257	23 11 21.9	4.022	21	19 48 36.33	2.6054	23 21 13.4	3.738
22	17 46 54.92	2.5298	23 15 18.8	3.873	22	19 51 12.62	2.6042	23 17 24.2	3.902
23	17 49 26.83	2.5338	S. 23° 19' 6.7	3.723	23	19 53 48.83	2.6028	S. 23° 13' 25.2	4.065
FRIDAY 14.					SUNDAY 16.				
0	17 51 58.98	2.5378	S. 23° 22' 45.6	3.573	0	19 56 24.96	2.6013	S. 23° 9' 16.4	4.227
1	17 54 31.37	2.5418	23 26 15.5	3.422	1	19 59 0.99	2.5997	23 4 57.9	4.389
2	17 57 4.00	2.5457	23 29 36.3	3.270	2	20 1 36.92	2.5980	23 0 29.7	4.551
3	17 59 36.86	2.5495	23 32 47.9	3.116	3	20 4 12.75	2.5962	22 55 51.8	4.719
4	18 2 9.94	2.5532	23 35 50.2	2.961	4	20 6 48.46	2.5942	22 51 4.2	4.879
5	18 4 43.24	2.5567	23 38 43.2	2.806	5	20 9 24.05	2.5922	22 46 7.1	5.039
6	18 7 16.75	2.5602	23 41 26.9	2.650	6	20 11 59.52	2.5900	22 41 0.4	5.191
7	18 9 50.46	2.5635	23 44 1.2	2.493	7	20 14 34.85	2.5877	22 35 44.2	5.349
8	18 12 24.37	2.5668	23 46 26.1	2.337	8	20 17 10.04	2.5853	22 30 18.5	5.507
9	18 14 58.18	2.5700	23 48 41.6	2.180	9	20 19 45.09	2.5829	22 24 43.4	5.663
10	18 17 32.77	2.5730	23 50 47.7	2.022	10	20 22 19.98	2.5803	22 18 58.9	5.819
11	18 20 7.24	2.5760	23 52 44.2	1.862	11	20 24 54.73	2.5776	22 13 5.1	5.974
12	18 22 41.89	2.5788	23 54 31.1	1.702	12	20 27 29.30	2.5749	22 7 2.0	6.128
13	18 25 16.70	2.5815	23 56 8.4	1.541	13	20 30 3.71	2.5721	22 0 49.7	6.282
14	18 27 51.67	2.5841	23 57 36.0	1.379	14	20 32 37.95	2.5691	21 54 28.2	6.434
15	18 30 26.79	2.5866	23 58 53.9	1.218	15	20 35 12.00	2.5659	21 47 57.6	6.586
16	18 33 2.06	2.5890	24 0 2.1	1.056	16	20 37 45.86	2.5627	21 41 17.9	6.737
17	18 35 37.47	2.5913	24 1 0.6	0.893	17	20 40 19.53	2.5595	21 34 29.2	6.886
18	18 38 13.02	2.5935	24 1 49.3	0.730	18	20 42 53.00	2.5562	21 27 31.6	7.034
19	18 40 48.69	2.5955	24 2 28.2	0.566	19	20 45 26.27	2.5528	21 20 25.1	7.182
20	18 43 24.18	2.5974	24 2 57.2	0.402	20	20 47 59.34	2.5494	21 13 9.7	7.329
21	18 46 0.38	2.5992	24 3 16.4	0.237	21	20 50 32.20	2.5458	21 5 45.6	7.473
22	18 48 36.39	2.6009	24 3 25.7	- 0.073	22	20 53 4.84	2.5422	20 58 12.9	7.617
23	18 51 12.49	2.6024	24 3 25.2	+ 0.091	23	20 55 37.26	2.5385	20 50 31.6	7.760
24	18 53 48.68	2.6038	S. 24° 3' 14.8	0.257	24	20 58 9.46	2.5347	S. 20° 42' 41.7	7.902

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff for 1 Minute.	Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	20 ^h 58 ^m 9.46	2.5347	S. 20° 42' 41.7	7.909	0	22 ^h 54 ^m 40.05	2.3138	S. 12° 6' 25.5	13.011
1	21 0 41.43	2.5308	20 34 43.3	8.043	1	22 56 58.74	2.3099	11 53 22.8	13.077
2	21 3 13.16	2.5269	20 26 36.5	8.189	2	22 59 17.16	2.3046	11 40 16.2	13.149
3	21 5 44.66	2.5230	20 18 21.4	8.321	3	23 1 35.30	2.3001	11 27 5.7	13.206
4	21 8 15.92	2.5189	20 9 58.0	8.458	4	23 3 53.17	2.2957	11 13 51.5	13.267
5	21 10 46.93	2.5148	20 1 26.4	8.594	5	23 6 10.78	2.2912	11 0 33.6	13.327
6	21 13 17.70	2.5107	19 52 46.7	8.728	6	23 8 28.12	2.2867	10 47 12.2	13.386
7	21 15 48.22	2.5065	19 43 59.0	8.869	7	23 10 45.19	2.2823	10 33 47.3	13.449
8	21 18 18.48	2.5022	19 35 3.3	8.993	8	23 13 2.00	2.2780	10 20 19.1	13.497
9	21 20 48.48	2.4978	19 25 59.8	9.123	9	23 15 18.55	2.2737	10 6 47.7	13.550
10	21 23 18.22	2.4935	19 16 48.5	9.259	10	23 17 34.84	2.2694	9 53 13.1	13.602
11	21 25 47.70	2.4892	19 7 29.5	9.390	11	23 19 50.88	2.2650	9 39 35.4	13.659
12	21 28 16.92	2.4847	18 58 2.9	9.507	12	23 22 6.66	2.2609	9 25 54.8	13.700
13	21 30 45.87	2.4803	18 48 28.7	9.639	13	23 24 22.19	2.2567	9 12 11.4	13.747
14	21 33 14.55	2.4757	18 38 47.1	9.754	14	23 26 37.47	2.2526	8 58 25.2	13.792
15	21 35 42.95	2.4711	18 28 58.2	9.876	15	23 28 52.51	2.2486	8 44 36.4	13.835
16	21 38 11.08	2.4665	18 19 2.0	9.997	16	23 31 7.30	2.2445	8 30 45.0	13.877
17	21 40 38.93	2.4618	18 8 58.6	10.116	17	23 33 21.85	2.2405	8 16 51.2	13.916
18	21 43 6.50	2.4572	17 58 48.1	10.233	18	23 35 36.16	2.2366	8 2 55.1	13.954
19	21 45 33.79	2.4525	17 48 30.6	10.349	19	23 37 50.24	2.2327	7 48 56.7	13.991
20	21 48 0.80	2.4478	17 38 6.2	10.464	20	23 40 4.08	2.2288	7 34 56.2	14.026
21	21 50 27.53	2.4431	17 27 34.9	10.577	21	23 42 17.69	2.2250	7 20 53.6	14.059
22	21 52 53.97	2.4383	17 16 56.9	10.689	22	23 44 31.08	2.2212	7 6 49.1	14.091
23	21 55 20.12	2.4335	S. 17° 6' 12.3	10.798	23	23 46 44.24	2.2175	S. 6° 52' 42.7	14.121
TUESDAY 18.					THURSDAY 20.				
0	21 57 45.99	2.4287	S. 16° 55' 21.2	10.906	0	23 48 57.18	2.2138	S. 6° 38' 34.6	14.149
1	22 0 11.57	2.4239	16 44 23.6	11.012	1	23 51 9.90	2.2102	6 24 24.8	14.177
2	22 2 36.86	2.4191	16 33 19.7	11.117	2	23 53 22.41	2.2067	6 10 13.4	14.202
3	22 5 1.86	2.4142	16 22 9.5	11.221	3	23 55 34.70	2.2032	5 56 0.6	14.225
4	22 7 26.57	2.4094	16 10 53.2	11.322	4	23 57 46.79	2.1997	5 41 46.4	14.247
5	22 9 50.99	2.4046	15 59 30.8	11.423	5	23 59 58.67	2.1963	5 27 30.9	14.268
6	22 12 15.12	2.3997	15 48 2.4	11.522	6	0 2 10.35	2.1930	5 13 14.2	14.287
7	22 14 38.96	2.3949	15 36 28.2	11.618	7	0 4 21.83	2.1897	4 58 56.5	14.304
8	22 17 2.51	2.3900	15 24 48.2	11.714	8	0 6 33.11	2.1864	4 44 37.8	14.320
9	22 19 25.76	2.3852	15 13 2.5	11.807	9	0 8 44.20	2.1832	4 30 18.1	14.336
10	22 21 48.73	2.3804	15 1 11.3	11.899	10	0 10 55.10	2.1801	4 15 57.5	14.348
11	22 24 11.41	2.3755	14 49 14.6	11.990	11	0 13 5.81	2.1770	4 1 36.3	14.358
12	22 26 33.79	2.3706	14 37 12.5	12.079	12	0 15 16.34	2.1740	3 47 14.5	14.367
13	22 28 55.88	2.3658	14 25 5.1	12.166	13	0 17 26.69	2.1710	3 32 52.2	14.376
14	22 31 17.69	2.3611	14 12 52.6	12.251	14	0 19 36.86	2.1680	3 18 29.4	14.383
15	22 33 39.21	2.3563	14 0 35.0	12.334	15	0 21 46.85	2.1651	3 4 6.2	14.389
16	22 36 0.44	2.3514	13 48 12.5	12.416	16	0 23 56.67	2.1623	2 49 42.7	14.392
17	22 38 21.38	2.3466	13 35 45.1	12.497	17	0 26 6.33	2.1596	2 35 19.1	14.394
18	22 40 42.04	2.3419	13 23 12.9	12.575	18	0 28 15.83	2.1570	2 20 55.4	14.395
19	22 43 2.41	2.3372	13 10 36.1	12.652	19	0 30 25.17	2.1543	2 6 31.7	14.394
20	22 45 22.50	2.3325	12 57 54.7	12.727	20	0 32 34.35	2.1517	1 52 8.1	14.392
21	22 47 42.31	2.3278	12 45 8.8	12.801	21	0 34 43.37	2.1491	1 37 44.6	14.390
22	22 50 1.83	2.3231	12 32 18.6	12.873	22	0 36 52.24	2.1467	1 23 21.3	14.385
23	22 52 21.08	2.3185	12 19 24.1	12.943	23	0 39 0.97	2.1443	1 8 58.4	14.377
24	22 54 40.05	2.3138	S. 12° 6' 25.5	13.011	24	0 41 9.55	2.1419	S. 0° 54' 36.0	14.369

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	^h 0 ^m 41 ^s 9.55	2.1419	S. 0° 54' 36.0"	14.369	0	^h 2 ^m 22 ^s 16.99	2.0913	N. 10° 1' 46.3"	12.539
1	0 43 18.00	2.1396	0 40 14.1	14.361	1	2 24 22.47	2.0914	10 14 16.3	12.467
2	0 45 26.31	2.1373	0 25 52.7	14.351	2	2 26 27.96	2.0915	10 26 42.4	12.402
3	0 47 34.48	2.1351	S. 0 11 32.0	14.338	3	2 28 33.45	2.0917	10 39 4.5	12.335
4	0 49 42.52	2.1330	N. 0 2 47.9	14.325	4	2 30 38.96	2.0919	10 51 22.6	12.268
5	0 51 50.44	2.1309	0 17 7.0	14.311	5	2 32 44.48	2.0922	11 3 36.7	12.200
6	0 53 58.23	2.1288	0 31 25.2	14.295	6	2 34 50.02	2.0925	11 15 46.6	12.130
7	0 56 5.90	2.1269	0 45 42.4	14.277	7	2 36 55.58	2.0928	11 27 52.3	12.060
8	0 58 13.46	2.1250	0 59 58.5	14.258	8	2 39 1.16	2.0932	11 39 53.8	11.989
9	1 0 20.90	2.1231	1 14 13.4	14.238	9	2 41 6.76	2.0936	11 51 51.0	11.917
10	1 2 28.23	2.1213	1 28 27.1	14.217	10	2 43 12.39	2.0941	12 3 43.9	11.845
11	1 4 35.46	2.1196	1 42 39.4	14.194	11	2 45 18.05	2.0946	12 15 32.4	11.771
12	1 6 42.59	2.1179	1 56 50.3	14.170	12	2 47 23.74	2.0951	12 27 16.4	11.696
13	1 8 49.61	2.1162	2 10 59.8	14.145	13	2 49 29.46	2.0956	12 38 55.9	11.621
14	1 10 56.54	2.1147	2 25 7.7	14.118	14	2 51 35.21	2.0962	12 50 30.9	11.545
15	1 13 3.38	2.1132	2 39 14.0	14.091	15	2 53 41.00	2.0968	13 2 1.3	11.468
16	1 15 10.13	2.1117	2 53 18.6	14.062	16	2 55 46.83	2.0975	13 13 27.1	11.392
17	1 17 16.79	2.1103	3 7 21.4	14.032	17	2 57 52.70	2.0981	13 24 48.3	11.314
18	1 19 23.36	2.1089	3 21 22.4	14.000	18	2 59 58.60	2.0987	13 36 4.8	11.235
19	1 21 29.85	2.1076	3 35 21.4	13.967	19	3 2 4.54	2.0994	13 47 16.5	11.154
20	1 23 36.27	2.1063	3 49 18.4	13.933	20	3 4 10.53	2.1002	13 58 23.3	11.073
21	1 25 42.61	2.1051	4 3 13.4	13.899	21	3 6 16.57	2.1011	14 9 25.3	10.992
22	1 27 48.88	2.1040	4 17 6.3	13.862	22	3 8 22.66	2.1019	14 20 22.4	10.910
23	1 29 55.09	2.1029	N. 4 30 56.9	13.824	23	3 10 28.80	2.1027	N. 14 31 14.5	10.827
SATURDAY 22.					MONDAY 24.				
0	1 32 1.23	2.1018	N. 4 44 45.2	13.785	0	3 12 34.99	2.1036	N. 14 42 1.6	10.743
1	1 34 7.31	2.1008	4 58 31.1	13.745	1	3 14 41.23	2.1044	14 52 43.7	10.659
2	1 36 13.33	2.0999	5 12 11.6	13.704	2	3 16 47.52	2.1053	15 3 20.7	10.574
3	1 38 19.30	2.0990	5 25 55.6	13.662	3	3 18 53.86	2.1062	15 13 52.6	10.488
4	1 40 25.21	2.0981	5 39 34.1	13.620	4	3 21 0.26	2.1072	15 24 19.3	10.402
5	1 42 31.07	2.0973	5 53 10.0	13.576	5	3 23 6.72	2.1081	15 34 40.8	10.315
6	1 44 36.89	2.0966	6 6 43.2	13.530	6	3 25 13.23	2.1090	15 44 57.1	10.227
7	1 46 42.66	2.0959	6 20 13.6	13.483	7	3 27 19.80	2.1101	15 55 8.1	10.138
8	1 48 48.39	2.0953	6 33 41.2	13.436	8	3 29 26.44	2.1112	16 5 13.7	10.049
9	1 50 54.09	2.0947	6 47 5.9	13.387	9	3 31 33.14	2.1122	16 15 14.0	9.960
10	1 52 59.75	2.0941	7 0 27.6	13.337	10	3 33 39.90	2.1132	16 25 8.9	9.870
11	1 55 5.38	2.0936	7 13 46.3	13.286	11	3 35 46.72	2.1142	16 34 58.4	9.779
12	1 57 10.99	2.0932	7 27 1.9	13.233	12	3 37 53.60	2.1152	16 44 42.4	9.687
13	1 59 16.57	2.0928	7 40 11.3	13.180	13	3 40 0.55	2.1163	16 54 20.9	9.595
14	2 1 22.13	2.0924	7 53 23.5	13.127	14	3 42 7.56	2.1174	17 3 53.8	9.502
15	2 3 27.66	2.0920	8 6 29.5	13.073	15	3 44 14.64	2.1186	17 13 21.1	9.408
16	2 5 33.17	2.0918	8 19 32.2	13.017	16	3 46 21.79	2.1197	17 22 42.8	9.314
17	2 7 38.67	2.0916	8 32 31.5	12.959	17	3 48 29.01	2.1209	17 31 58.8	9.219
18	2 9 44.16	2.0914	8 45 27.3	12.901	18	3 50 36.30	2.1221	17 41 9.1	9.124
19	2 11 49.64	2.0913	8 58 19.6	12.842	19	3 52 43.66	2.1232	17 50 13.7	9.028
20	2 13 55.11	2.0912	9 11 8.3	12.782	20	3 54 51.08	2.1243	17 59 12.5	8.932
21	2 16 0.58	2.0912	9 23 53.4	12.721	21	3 56 58.57	2.1254	18 8 5.5	8.835
22	2 18 6.05	2.0912	9 36 34.8	12.659	22	3 59 6.13	2.1266	18 16 52.7	8.737
23	2 20 11.52	2.0912	9 49 12.5	12.596	23	4 1 13.76	2.1277	18 25 34.0	8.639
24	2 22 16.99	2.0913	N. 10 1 46.3	12.532	24	4 3 21.46	2.1289	N. 18 34 9.4	8.541

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	4 3 21.46	2.1289	N.18° 34' 9.4"	8.541	0	5 46 46.41	2.1735	N.23° 22' 23.2"	2.341
1	4 5 29.23	2.1301	18 42 38.9	8.442	1	5 48 56.83	2.1738	23 25 40.2	2.326
2	4 7 37.07	2.1313	18 51 2.4	8.342	2	5 51 7.27	2.1742	23 28 50.3	2.112
3	4 9 44.99	2.1326	18 59 19.9	8.242	3	5 53 17.74	2.1746	23 31 53.6	2.997
4	4 11 52.98	2.1338	19 7 31.4	8.142	4	5 55 28.22	2.1749	23 34 49.9	2.881
5	4 14 1.04	2.1349	19 15 36.9	8.041	5	5 57 38.72	2.1751	23 37 39.3	2.766
6	4 16 9.17	2.1361	19 23 36.3	7.939	6	5 59 49.23	2.1753	23 40 21.8	2.651
7	4 18 17.37	2.1372	19 31 29.6	7.837	7	6 1 59.75	2.1754	23 42 57.4	2.535
8	4 20 25.64	2.1384	19 39 16.7	7.734	8	6 4 10.28	2.1756	23 45 26.0	2.419
9	4 22 33.98	2.1396	19 46 57.7	7.631	9	6 6 20.82	2.1757	23 47 47.7	2.304
10	4 24 42.39	2.1407	19 54 32.5	7.527	10	6 8 31.36	2.1757	23 50 2.5	2.188
11	4 26 50.87	2.1419	20 2 1.0	7.423	11	6 10 41.90	2.1758	23 52 10.3	2.072
12	4 28 59.42	2.1431	20 9 23.3	7.319	12	6 12 52.45	2.1758	23 54 11.2	1.957
13	4 31 8.04	2.1442	20 16 39.3	7.214	13	6 15 2.99	2.1757	23 56 5.1	1.841
14	4 33 16.73	2.1454	20 23 49.0	7.109	14	6 17 13.53	2.1756	23 57 52.1	1.726
15	4 35 25.49	2.1465	20 30 52.4	7.004	15	6 19 24.06	2.1754	23 59 32.2	1.610
16	4 37 34.31	2.1476	20 37 49.5	6.898	16	6 21 34.58	2.1753	24 1 5.3	1.493
17	4 39 43.20	2.1487	20 44 40.2	6.792	17	6 23 45.09	2.1751	24 2 31.4	1.377
18	4 41 52.16	2.1498	20 51 24.5	6.685	18	6 25 55.59	2.1748	24 3 50.6	1.262
19	4 44 1.18	2.1509	20 58 2.4	6.577	19	6 28 6.07	2.1745	24 5 2.8	1.146
20	4 46 10.27	2.1520	21 4 33.8	6.470	20	6 30 16.53	2.1742	24 6 8.1	1.031
21	4 48 19.42	2.1530	21 10 58.8	6.362	21	6 32 26.98	2.1739	24 7 6.5	0.915
22	4 50 28.63	2.1541	21 17 17.3	6.254	22	6 34 37.40	2.1735	24 7 57.9	0.799
23	4 52 37.91	2.1552	N.21° 23' 29.3"	6.146	23	6 36 47.80	2.1731	N.24° 8' 42.4"	0.684
WEDNESDAY 26.					FRIDAY 28.				
0	4 54 47.25	2.1562	N.21° 29' 34.8"	6.037	0	6 38 58.17	2.1726	N.24° 9' 20.0"	0.568
1	4 56 56.65	2.1572	21 35 33.7	5.927	1	6 41 8.51	2.1721	24 9 50.6	0.452
2	4 59 6.11	2.1581	21 41 26.1	5.818	2	6 43 18.82	2.1716	24 10 14.3	0.337
3	5 1 15.62	2.1590	21 47 11.9	5.708	3	6 45 29.10	2.1710	24 10 31.1	0.222
4	5 3 25.19	2.1600	21 52 51.1	5.597	4	6 47 39.34	2.1703	24 10 40.9	+ 0.106
5	5 5 34.82	2.1609	21 58 23.6	5.487	5	6 49 49.54	2.1697	24 10 43.8	- 0.009
6	5 7 44.50	2.1618	22 3 49.5	5.376	6	6 51 59.70	2.1690	24 10 39.8	0.194
7	5 9 54.23	2.1627	22 9 8.7	5.265	7	6 54 9.82	2.1682	24 10 28.9	0.239
8	5 12 4.02	2.1636	22 14 21.3	5.154	8	6 56 19.89	2.1675	24 10 11.1	0.354
9	5 14 13.86	2.1644	22 19 27.2	5.043	9	6 58 29.92	2.1667	24 9 46.4	0.468
10	5 16 23.75	2.1652	22 24 26.4	4.931	10	7 0 39.90	2.1658	24 9 14.9	0.582
11	5 18 33.68	2.1659	22 29 18.9	4.818	11	7 2 49.82	2.1649	24 8 36.5	0.697
12	5 20 43.66	2.1667	22 34 4.6	4.706	12	7 4 59.69	2.1640	24 7 51.2	0.812
13	5 22 53.68	2.1674	22 38 43.6	4.593	13	7 7 9.50	2.1630	24 6 59.1	0.926
14	5 25 3.75	2.1682	22 43 15.8	4.480	14	7 9 19.25	2.1621	24 6 0.1	1.040
15	5 27 13.86	2.1688	22 47 41.2	4.368	15	7 11 28.95	2.1611	24 4 54.3	1.153
16	5 29 24.01	2.1695	22 51 59.9	4.255	16	7 13 38.58	2.1600	24 3 41.7	1.267
17	5 31 34.20	2.1701	22 56 11.8	4.141	17	7 15 48.15	2.1589	24 2 22.2	1.381
18	5 33 44.42	2.1707	23 0 16.8	4.027	18	7 17 57.65	2.1578	24 0 55.9	1.494
19	5 35 54.68	2.1712	23 4 15.0	3.913	19	7 20 7.08	2.1566	23 59 22.9	1.607
20	5 38 4.97	2.1717	23 8 6.4	3.799	20	7 22 16.44	2.1553	23 57 43.1	1.720
21	5 40 15.29	2.1722	23 11 50.9	3.684	21	7 24 25.72	2.1541	23 55 56.5	1.832
22	5 42 25.64	2.1727	23 15 28.5	3.570	22	7 26 34.93	2.1528	23 54 3.2	1.945
23	5 44 36.01	2.1731	23 18 59.3	3.456	23	7 28 44.06	2.1515	23 52 3.1	2.057
24	5 46 46.41	2.1735	N.23° 22' 23.2"	3.341	24	7 30 53.11	2.1502	N.23° 49' 56.3"	2.169

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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SATURDAY 29.

0	7 30 53.11	2.1509	N.23 49 56.3	2.169
1	7 33 2.08	2.1488	23 47 42.8	2.261
2	7 35 10.97	2.1474	23 45 22.6	2.399
3	7 37 19.77	2.1460	23 42 55.8	2.503
4	7 39 28.49	2.1445	23 40 22.3	2.614
5	7 41 37.11	2.1439	23 37 42.1	2.735
6	7 43 45.64	2.1414	23 34 55.3	2.835
7	7 45 54.08	2.1399	23 32 1.9	2.945
8	7 48 2.43	2.1383	23 29 1.9	3.055
9	7 50 10.68	2.1367	23 25 55.3	3.164
10	7 52 18.83	2.1350	23 22 42.2	3.273
11	7 54 26.88	2.1334	23 19 22.6	3.389
12	7 56 34.84	2.1317	23 15 50.4	3.491
13	7 58 42.69	2.1300	23 12 23.7	3.599
14	8 0 50.44	2.1289	23 8 44.5	3.707
15	8 2 58.08	2.1264	23 4 58.9	3.814
16	8 5 5.61	2.1246	23 1 6.9	3.931
17	8 7 13.03	2.1238	22 57 8.4	4.086
18	8 9 20.35	2.1211	22 53 3.5	4.134
19	8 11 27.56	2.1199	22 48 52.3	4.240
20	8 13 34.65	2.1179	22 44 34.7	4.346
21	8 15 41.63	2.1153	22 40 10.7	4.459
22	8 17 48.49	2.1134	22 35 40.4	4.587
23	8 19 55.24	2.1115	N.22 31 3.9	4.661

SUNDAY 30.

0	8 22 1.87	2.1095	N.22 26 21.1	4.785
1	8 24 8.38	2.1075	22 21 32.1	4.869
2	8 26 14.77	2.1055	22 16 36.9	4.979
3	8 28 21.04	2.1035	22 11 35.4	5.076
4	8 30 27.19	2.1015	22 6 27.8	5.178
5	8 32 33.22	2.0994	22 1 14.1	5.279
6	8 34 39.12	2.0973	21 55 54.3	5.381
7	8 36 44.90	2.0953	21 50 28.4	5.489
8	8 38 50.56	2.0939	21 44 56.4	5.583
9	8 40 56.09	2.0911	21 39 18.4	5.683
10	8 43 1.49	2.0890	21 33 34.4	5.783
11	8 45 6.77	2.0880	21 27 44.4	5.883
12	8 47 11.92	2.0847	21 21 48.4	5.983
13	8 49 16.94	2.0896	21 15 46.5	6.081
14	8 51 21.83	2.0895	21 9 38.7	6.178
15	8 53 26.60	2.0784	21 3 26.1	6.276
16	8 55 31.24	2.0769	20 57 5.6	6.373
17	8 57 35.75	2.0740	20 50 40.3	6.469
18	8 59 40.12	2.0718	20 44 9.3	6.565
19	9 1 44.36	2.0697	20 37 32.5	6.661
20	9 3 48.48	2.0676	20 30 50.0	6.756
21	9 5 52.47	2.0654	20 24 1.8	6.851
22	9 7 56.33	2.0639	20 17 7.9	6.946
23	9 10 0.05	2.0609	20 10 8.3	7.040
24	9 12 3.64	2.0588	N.20 3 3.1	7.133

MONDAY 31.

0	9 12 3.64	2.0588	N.20 3 3.1	7.133
1	9 14 7.11	2.0566	19 55 52.4	7.285
2	9 16 10.44	2.0544	19 48 36.1	7.317
3	9 18 13.64	2.0523	19 41 14.3	7.408
4	9 20 16.71	2.0502	19 33 47.1	7.499
5	9 22 19.66	2.0480	19 26 14.4	7.590
6	9 24 22.47	2.0458	19 18 36.3	7.680
7	9 26 25.15	2.0437	19 10 52.8	7.769
8	9 28 27.71	2.0416	19 3 4.0	7.858
9	9 30 30.14	2.0394	18 55 9.8	7.947
10	9 32 32.44	2.0373	18 47 10.4	8.034
11	9 34 34.61	2.0352	18 39 5.7	8.121
12	9 36 36.66	2.0331	18 30 55.8	8.208
13	9 38 38.58	2.0309	18 22 40.7	8.294
14	9 40 40.37	2.0288	18 14 20.5	8.379
15	9 42 42.04	2.0267	18 5 55.2	8.464
16	9 44 43.58	2.0247	17 57 24.8	8.549
17	9 46 45.00	2.0227	17 48 49.3	8.633
18	9 48 46.30	2.0206	17 40 8.8	8.717
19	9 50 47.47	2.0186	17 31 23.3	8.799
20	9 52 48.53	2.0167	17 22 32.9	8.881
21	9 54 49.47	2.0147	17 13 37.6	8.968
22	9 56 50.29	2.0127	17 4 37.4	9.043
23	9 58 50.99	2.0107	N.16 55 32.4	9.128

TUESDAY, APRIL 1.

0	10 0 51.57	2.0087	N.16 46 22.6	9.203
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PHASES OF THE MOON.

○ Full Moon	March	d	h	m
☾ Last Quarter		13	16	4.7
● New Moon		20	9	1.4
☽ First Quarter		27	21	32.6

☾ Apogee	March	d	h
☾ Perigee		17	14.9
☾ Apogee		29	9.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	SUN W.	12 ^h 44' 51"	3488	12 ^h 5' 31"	3487	12 ^h 26' 9"	3487	12 ^h 46' 47"	3488
	α Arietis W.	66 42 23	3234	68 7 52	3230	69 33 25	3228	70 59 1	3225
	Aldebaran W.	34 58 16	3102	36 26 23	3101	37 54 31	3100	39 22 41	3098
	Regulus E.	45 39 20	3098	44 11 7	3099	42 42 56	3100	41 14 46	3101
	SATURN E.	47 1 1	3058	45 32 0	3059	44 3 0	3059	42 34 0	3060
	Spica E.	99 41 31	3108	98 13 32	3108	96 45 34	3108	95 17 35	3108
2	α Arietis W.	78 7 58	3208	79 33 58	3204	81 0 3	3200	82 26 12	3195
	Aldebaran W.	46 44 9	3068	48 12 36	3069	49 41 7	3078	51 9 43	3075
	Regulus E.	33 54 10	3102	32 26 3	3102	30 57 56	3103	29 29 51	3103
	SATURN E.	35 8 59	3056	33 39 55	3055	32 10 50	3053	30 41 43	3051
	Spica E.	87 57 22	3099	86 29 12	3097	85 1 0	3095	83 32 45	3092
3	α Arietis W.	89 38 18	3172	91 4 59	3168	92 31 46	3163	93 58 39	3158
	Aldebaran W.	58 33 55	3053	60 3 3	3047	61 32 17	3042	63 1 37	3036
	Spica E.	76 10 27	3072	74 41 44	3068	73 12 57	3064	71 44 3	3059
4	Aldebaran W.	70 30 11	3005	72 0 17	2993	73 30 32	2992	75 0 55	2985
	Pollux W.	26 34 55	3069	28 3 42	3056	29 32 45	3043	31 2 4	3031
	Spica E.	64 18 4	3033	62 48 32	3028	61 18 53	3022	59 49 7	3016
	MARS E.	103 0 43	3146	101 33 29	3139	100 6 7	3132	98 38 36	3125
	Antares E.	110 11 52	3098	108 42 12	3019	107 12 24	3012	105 42 26	3005
5	Aldebaran W.	82 35 7	2947	84 6 26	2940	85 37 54	2932	87 9 32	2923
	Pollux W.	33 32 13	2977	40 2 54	2967	41 33 48	2957	43 4 55	2947
	Spica E.	52 18 32	2987	50 48 3	2981	49 17 28	2975	47 46 45	2969
	MARS E.	91 18 45	3068	89 50 18	3077	88 21 40	3069	86 52 53	3060
	Antares E.	98 10 17	2996	96 39 22	2958	95 8 18	2950	93 37 3	2942
6	Pollux W.	50 43 30	2900	52 15 49	2891	53 48 20	2891	55 21 3	2872
	Spica E.	40 11 41	2949	38 40 25	2946	37 9 4	2943	35 37 40	2941
	MARS E.	79 26 20	3018	77 56 29	3009	76 26 28	3000	74 56 15	2992
	Antares E.	85 58 18	2902	84 26 2	2894	82 53 35	2896	81 20 58	2878
7	Pollux W.	63 7 33	2898	64 41 25	2818	66 15 30	2809	67 49 46	2800
	Regulus W.	27 12 37	2852	28 45 57	2840	30 19 33	2838	31 53 25	2815
	MARS E.	67 22 27	2947	65 51 8	2938	64 19 37	2929	62 47 55	2920
	Antares E.	73 35 18	2837	72 1 39	2829	70 27 50	2821	68 53 50	2813
	α Aquilæ E.	117 8 41	2730	115 52 26	2697	114 35 36	2687	113 18 14	2636
8	Pollux W.	75 44 4	2755	77 19 30	2747	78 55 7	2739	80 30 55	2730
	Regulus W.	39 46 23	2763	41 21 39	2753	42 57 8	2744	44 32 50	2734
	SATURN W.	38 47 58	2796	40 24 3	2717	42 0 20	2708	43 36 49	2699
	MARS E.	55 6 35	2875	53 33 44	2856	52 0 42	2858	50 27 29	2849
	Antares E.	61 1 19	2775	59 26 19	2767	57 51 10	2760	56 15 51	2753
	α Aquilæ E.	106 44 4	2515	105 23 57	2485	104 3 27	2476	102 42 36	2459
9	Pollux W.	88 32 50	2687	90 9 47	2678	91 46 56	2670	93 24 16	2661
	Regulus W.	52 34 30	2687	54 11 27	2678	55 48 36	2669	57 25 57	2660
	SATURN W.	51 42 15	2655	53 19 55	2646	54 57 47	2637	56 35 51	2630
	MARS E.	42 38 30	2604	41 4 8	2595	39 29 34	2586	37 54 48	2578
	Antares E.	48 17 1	2721	46 40 50	2715	45 4 31	2709	43 28 4	2704

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
1	SUN	W.	127° 7' 24"	3486	128° 28' 1"	3487	129° 48' 39"	3487	131° 9' 17"	3486
	α Arietis	W.	72 24 40	3921	73 50 23	3918	75 16 11	3915	76 42 2	3911
	Aldebaran	W.	40 50 53	3096	42 19 8	3094	43 47 25	3091	45 15 45	3088
	Regulus	E.	39 46 38	3101	38 18 30	3109	36 50 23	3109	35 22 16	3103
	SATURN	E.	41 5 1	3060	39 36 2	3059	38 7 2	3058	36 38 1	3057
	Spica	E.	93 49 35	3107	92 21 34	3106	90 53 32	3104	89 25 28	3102
2	α Arietis	W.	83 52 27	3191	85 18 47	3187	86 45 12	3189	88 11 42	3177
	Aldebaran	W.	52 38 23	3071	54 7 8	3067	55 35 58	3063	57 4 53	3057
	Regulus	E.	28 1 46	3105	26 33 42	3106	25 5 39	3108	23 37 39	3110
	SATURN	E.	29 12 34	3049	27 43 22	3047	26 14 8	3047	24 44 53	3046
	Spica	E.	82 4 26	3069	80 36 3	3065	79 7 36	3061	77 39 4	3077
3	α Arietis	W.	95 25 38	3153	96 52 43	3148	98 19 54	3143	99 47 11	3138
	Aldebaran	W.	64 31 5	3030	66 0 40	3024	67 30 23	3018	69 0 13	3019
	Spica	E.	70 15 4	3054	68 45 58	3049	67 16 46	3044	65 47 28	3039
4	Aldebaran	W.	76 31 27	2977	78 2 8	2970	79 32 58	2969	81 3 58	2955
	Pollux	W.	32 31 38	3090	34 1 26	3099	35 31 28	3096	37 1 44	2987
	Spica	E.	58 19 15	3010	56 49 15	3005	55 19 7	2999	53 48 53	2993
	MARS	E.	97 10 57	3117	95 43 8	3109	94 15 10	3101	92 47 2	3094
	Antares	E.	104 12 19	2997	102 42 3	2990	101 11 37	2982	99 41 2	2974
5	Aldebaran	W.	88 41 21	2916	90 13 19	2908	91 45 28	2900	93 17 47	2892
	Pollux	W.	44 36 14	2938	46 7 45	2928	47 39 28	2919	49 11 23	2909
	Spica	E.	46 15 57	2965	44 45 1	2960	43 14 0	2957	41 42 53	2953
	MARS	E.	85 23 55	3059	83 54 47	3043	82 25 28	3035	80 55 59	3027
	Antares	E.	92 5 39	2934	90 34 4	2926	89 2 19	2918	87 30 23	2910
6	Pollux	W.	56 53 57	2963	58 27 4	2954	60 0 22	2945	61 33 52	2936
	Spica	E.	34 6 14	2941	32 34 48	2941	31 3 21	2943	29 31 57	2946
	MARS	E.	73 25 52	2983	71 55 18	2974	70 24 32	2965	68 53 35	2956
	Antares	E.	79 48 11	2970	78 15 14	2962	76 42 6	2954	75 8 47	2946
7	Pollux	W.	69 24 14	2791	70 58 54	2782	72 33 46	2773	74 8 49	2764
	Regulus	W.	33 27 33	2905	35 1 54	2794	36 36 30	2783	38 11 20	2773
	MARS	E.	61 16 2	2911	59 43 57	2902	58 11 41	2903	56 39 14	2894
	Antares	E.	67 19 39	2906	65 45 19	2798	64 10 49	2790	62 36 9	2782
	α Aquilæ	E.	112 0 19	3610	110 41 56	3584	109 23 5	3559	108 3 46	3538
8	Pollux	W.	82 6 55	2729	83 43 6	2713	85 19 29	2704	86 56 4	2695
	Regulus	W.	46 8 45	2724	47 44 53	2715	49 21 13	2706	50 57 45	2696
	SATURN	W.	45 13 30	2690	46 50 23	2681	48 27 29	2679	50 4 46	2663
	MARS	E.	48 54 4	2640	47 20 28	2631	45 46 40	2622	44 12 41	2613
	Antares	E.	54 40 23	2746	53 4 45	2739	51 28 59	2733	49 53 4	2727
	α Aquilæ	E.	101 21 26	3441	99 59 56	3426	98 38 9	3412	97 16 6	3398
9	Pollux	W.	95 1 48	2653	96 39 31	2645	98 17 25	2637	99 55 30	2628
	Regulus	W.	59 3 30	2651	60 41 15	2643	62 19 12	2634	63 57 21	2624
	SATURN	W.	58 14 6	2620	59 52 33	2619	61 31 12	2603	63 10 3	2594
	MARS	E.	36 19 51	2769	34 44 42	2760	33 9 22	2751	31 33 50	2742
	Antares	E.	41 51 31	2760	40 14 51	2696	38 38 6	2692	37 1 16	2680

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
9	α Aquilæ E. JUPITER E.	95 53 48 102 7 48	3385 9743	94 31 15 100 32 5	3373 9734	93 8 26 98 56 10	3363 9725	91 45 29 97 20 4	3354 9716
10	Regulus W. SATURN W. Antares E. α Aquilæ E. JUPITER E.	65 35 43 64 49 6 35 24 22 84 48 12 89 16 39	9616 9585 9688 3390 9673	67 14 16 66 28 21 33 47 26 83 24 24 87 39 23	9607 9577 9686 3316 9664	68 53 2 68 7 47 32 10 28 82 0 31 86 1 55	9598 9569 9686 3313 9655	70 32 0 69 47 25 30 33 30 80 36 35 84 24 15	9590 9560 9688 3311 9647
11	Regulus W. SATURN W. Spica W. α Aquilæ E. JUPITER E. SUN E.	78 49 49 78 8 35 25 24 8 73 36 58 76 13 0 123 41 5	9546 9517 9689 3394 9603 9696	80 29 59 79 49 25 27 1 2 72 13 13 74 34 9 122 8 41	9537 9508 9684 3330 9594 9685	82 10 21 81 30 27 28 38 30 70 49 36 72 55 6 120 36 3	9537 9499 9643 3336 9585 9675	83 50 56 83 11 41 30 16 28 69 26 7 71 15 51 119 3 12	9519 9490 9691 3347 9576 9685
12	Regulus W. SATURN W. Spica W. α Aquilæ E. JUPITER E. SUN E.	92 16 56 91 40 59 38 32 39 62 32 15 62 56 30 111 15 43	9474 9446 9538 3496 9532 9614	93 58 46 93 23 28 40 12 59 61 10 28 61 16 1 109 41 34	9465 9436 9594 3449 9592 9604	95 40 48 95 6 9 41 53 38 59 49 7 59 35 19 108 7 12	9456 9439 9511 3475 9514 9794	97 23 3 96 49 3 43 34 36 58 28 15 57 54 25 106 32 36	9448 9419 9498 3505 9505 9785
13	Regulus W. Spica W. JUPITER E. α Aquilæ E. SUN E.	105 57 26 52 3 48 49 26 47 51 53 39 98 36 26	9403 9438 9460 3790 9735	107 40 56 53 46 28 47 44 38 50 37 13 97 0 33	9394 9427 9451 3778 9785	109 24 39 55 29 23 46 2 16 49 21 48 95 24 26	9385 9416 9443 3846 9715	111 8 35 57 12 34 44 19 43 48 7 34 93 48 6	9377 9405 9434 3891 9706
14	Spica W. MARS W. Antares W. JUPITER E. SUN E.	65 52 10 22 59 27 20 26 29 35 43 55 85 43 15	9366 9436 9525 3383 9656	67 36 48 24 42 10 22 7 7 34 0 10 84 5 39	9346 9427 9492 3386 9649	69 21 40 26 25 6 23 48 31 32 16 15 82 27 50	9336 9418 9492 3378 9640	71 6 46 28 8 16 25 30 37 30 32 10 80 49 49	9327 9409 9435 3372 9631
15	Spica W. MARS W. Antares W. SUN E.	79 55 28 36 47 17 34 9 39 72 36 45	9285 9365 9336 9588	81 41 49 38 31 43 35 54 46 70 57 34	9277 9357 9322 9581	83 28 22 40 16 20 37 40 13 69 18 13	9269 9349 9306 9573	85 15 6 42 1 8 39 25 59 67 38 41	9269 9341 9297 9566
16	Spica W. MARS W. Antares W. SUN E.	94 11 21 50 47 51 48 19 0 59 18 41	9230 9306 9246 9536	95 59 3 52 33 41 50 6 19 57 38 16	9225 9300 9239 9529	97 46 54 54 19 40 51 53 48 55 57 43	9220 9295 9232 9525	99 34 52 56 5 47 53 41 29 54 17 4	9215 9289 9225 9520
17	MARS W. Antares W. SUN E.	64 58 11 62 42 11 45 52 34	9288 9198 9507	66 44 57 64 30 41 44 11 31	9285 9194 9506	68 31 48 66 19 17 42 30 26	9263 9191 9506	70 18 42 68 7 58 40 49 21	9261 9188 9506
18	MARS W. Antares W. SUN E.	79 13 46 77 12 3 32 24 38	9257 9184 9585	81 0 48 79 0 55 30 44 0	9257 9184 9533	82 47 50 80 49 46 29 3 32	9259 9186 9549	84 34 49 82 38 34 27 23 17	9262 9188 9553

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
9	α Aquilæ E. JUPITER E.	90° 22' 20" 95 43 46	3344 3708	88° 59' 0" 94 7 17	3337 3690	87° 35' 32" 92 30 36	3330 3690	86° 11' 55" 90 53 43	3394 3698
10	Regulus W. SATURN W. Antares E. α Aquilæ E. JUPITER E.	72 11 9 71 27 15 28 56 34 79 12 37 82 46 24	3580 3551 3693 3311 3638	73 50 31 73 7 17 27 19 45 77 48 39 81 8 21	3571 3543 3690 3313 3690	75 30 5 74 47 31 25 43 3 76 24 43 79 30 6	3563 3534 3705 3315 3690	77 9 51 76 27 57 24 6 30 75 0 48 77 51 39	3554 3595 3716 3318 3612
11	Regulus W. SATURN W. Spica W. α Aquilæ E. JUPITER E. SUN E.	85 31 43 84 53 8 31 54 54 68 2 50 69 36 23 117 30 8	3510 3498 3601 3358 3567 3655	87 12 42 86 34 47 33 33 45 66 39 46 67 56 43 115 56 51	3501 3473 3584 3371 3558 3645	88 53 54 88 16 39 35 13 1 65 16 57 66 16 51 114 23 21	3493 3464 3568 3367 3550 3635	90 35 19 89 58 43 36 52 39 63 54 26 64 36 47 112 49 38	3483 3455 3658 3405 3540 3695
12	Regulus W. SATURN W. Spica W. α Aquilæ E. JUPITER E. SUN E.	99 5 30 98 32 10 45 15 53 57 7 57 56 13 18 104 57 48	3438 3410 3496 3541 3498 3775	100 48 10 100 15 30 46 57 26 55 48 18 54 31 59 103 22 47	3429 3409 3473 3578 3487 3785	102 31 3 101 59 2 48 30 17 54 29 18 52 50 27 101 47 33	3421 3393 3461 3619 3478 3755	104 14 8 103 42 47 50 21 25 53 11 4 51 8 43 100 12 6	3419 3394 3450 3684 3469 3745
13	Regulus W. Spica W. JUPITER E. α Aquilæ E. SUN E.	112 52 43 58 56 0 42 36 57 46 54 36 92 11 34	3368 3395 3498 4005 3695	114 37 4 60 39 41 40 53 59 45 43 2 90 34 48	3359 3365 3418 4100 3686	116 21 37 62 23 36 39 10 49 44 33 1 88 57 50	3351 3375 3410 4006 3677	118 6 22 64 7 46 37 27 28 43 24 41 87 20 39	3343 3365 3401 4329 3667
14	Spica W. MARS W. Antares W. JUPITER E. SUN E.	72 52 5 29 51 38 27 13 21 28 47 55 79 11 35	3319 3299 3409 3366 3692	74 37 37 31 35 14 28 56 42 27 3 31 77 33 10	3310 3291 3367 3380 3613	76 23 22 33 19 2 30 40 37 25 18 58 75 54 33	3301 3299 3399 3355 3605	78 9 19 35 3 3 32 24 56 23 34 18 74 15 45	3293 3373 3352 3350 3596
15	Spica W. MARS W. Antares W. SUN E.	87 2 1 43 46 8 41 12 4 65 59 0	3255 3334 3284 3559	88 49 6 45 31 18 42 58 26 64 19 9	3248 3396 3274 3558	90 36 22 47 16 39 44 45 3 62 39 8	3242 3319 3264 3546	92 23 46 49 2 10 46 31 55 60 58 59	3236 3313 3255 3540
16	Spica W. MARS W. Antares W. SUN E.	101 22 57 57 52 2 55 29 20 52 36 19	3210 3284 3218 3517	103 11 9 59 38 25 57 17 21 50 55 29	3207 3280 3212 3513	104 59 26 61 24 54 59 5 30 49 14 34	3204 3276 3207 3510	106 47 48 63 11 30 60 53 47 47 33 35	3200 3272 3202 3509
17	MARS W. Antares W. SUN E.	72 5 39 69 56 42 39 8 16	3259 3186 3509	73 52 39 71 45 30 37 27 15	3257 3185 3511	75 39 41 73 34 20 35 46 17	3257 3184 3515	77 26 43 75 23 11 34 5 24	3257 3184 3500
18	MARS W. Antares W. SUN E.	86 21 45 84 27 20 25 43 18	3264 3190 3568	88 8 38 86 16 3 24 3 37	3267 3194 3584	89 55 26 88 4 40 22 24 20	3270 3196 3605	91 42 9 89 53 13 20 45 32	3274 3201 3639

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	SUN	W.	21° 40' 15"	9879	23° 13' 1"	9889	24° 45' 43"	9887	26° 18' 19"	9893
	POLLUX	E.	89 11 37	9449	87 29 12	9464	85 47 8	9479	84 5 26	9495
23	SUN	W.	33 58 25	9950	35 29 40	9964	37 0 38	9977	38 31 18	9992
	POLLUX	E.	75 42 28	9576	74 3 0	9593	72 23 55	9609	70 45 12	9625
24	SUN	W.	46 0 2	3070	47 28 49	3086	48 57 16	3101	50 25 25	3116
	POLLUX	E.	62 37 12	9708	61 0 43	9725	59 24 36	9741	57 48 50	9757
	REGULUS	E.	98 34 54	9701	96 58 15	9716	95 21 56	9731	93 45 58	9747
25	SUN	W.	57 41 27	3193	59 7 45	3208	60 33 45	3222	61 59 28	3236
	α ARIETIS	W.	28 53 45	3397	30 16 5	3359	31 39 8	3329	33 2 46	3303
	POLLUX	E.	49 55 18	9836	48 21 37	9852	46 48 17	9867	45 15 16	9883
	SATURN	E.	85 37 7	9798	84 2 36	9811	82 28 23	9826	80 54 29	9839
	REGULUS	E.	85 51 13	9822	84 17 14	9837	82 43 34	9851	81 10 12	9864
26	SUN	W.	69 3 58	3303	70 28 6	3315	71 52 0	3326	73 15 41	3338
	α ARIETIS	W.	40 6 49	3231	41 32 21	3225	42 58 1	3219	44 23 47	3215
	POLLUX	E.	37 34 59	9856	36 3 51	9870	34 33 1	9885	33 2 29	3000
	SATURN	E.	73 9 13	9903	71 36 58	9915	70 4 58	9926	68 33 12	9937
	REGULUS	E.	73 27 37	9928	71 55 54	9940	70 24 26	9952	68 53 13	9968
27	SUN	W.	80 10 56	3388	81 33 26	3397	82 55 45	3408	84 17 55	3414
	α ARIETIS	W.	51 33 26	3208	52 59 25	3208	54 25 25	3208	55 51 24	3208
	ALDEBARAN	W.	19 27 41	3075	20 56 21	3077	22 24 59	3078	23 53 35	3079
	POLLUX	E.	25 34 30	3080	24 5 56	3098	22 37 44	3116	21 9 54	3138
	SATURN	E.	60 57 38	9985	59 27 6	9993	57 56 45	3002	56 26 35	3009
	REGULUS	E.	61 20 22	3019	59 50 24	3090	58 20 36	3029	56 50 59	3036
	SPICA	E.	115 19 35	3033	113 50 3	3041	112 20 41	3048	110 51 28	3054
28	SUN	W.	91 6 45	3445	92 28 11	3449	93 49 32	3454	95 10 48	3458
	α ARIETIS	W.	63 1 10	3212	64 27 5	3213	65 52 59	3213	67 18 53	3212
	ALDEBARAN	W.	31 16 26	3084	32 44 55	3086	34 13 21	3087	35 41 46	3089
	SATURN	E.	48 57 50	3040	47 28 27	3044	45 59 9	3049	44 29 57	3053
	REGULUS	E.	49 25 5	3069	47 56 17	3074	46 27 35	3079	44 59 0	3083
	SPICA	E.	103 27 11	3081	101 58 38	3085	100 30 10	3089	99 1 47	3092
29	SUN	W.	101 56 15	3469	103 17 14	3469	104 38 13	3469	105 59 12	3469
	α ARIETIS	W.	74 28 29	3209	75 54 27	3208	77 20 26	3207	78 46 27	3205
	ALDEBARAN	W.	43 3 31	3091	44 31 51	3091	46 0 11	3090	47 28 33	3089
	SATURN	E.	37 5 0	3066	35 36 9	3068	34 7 20	3069	32 38 33	3070
	REGULUS	E.	37 37 16	3100	36 9 6	3103	34 41 0	3105	33 12 57	3108
	SPICA	E.	91 40 36	3100	90 12 27	3101	88 44 19	3101	87 16 11	3100
30	SUN	W.	112 44 21	3480	114 5 30	3457	115 26 42	3453	116 47 59	3449
	α ARIETIS	W.	85 57 11	3192	87 23 30	3188	88 49 53	3184	90 16 21	3180
	ALDEBARAN	W.	54 50 55	3077	56 19 33	3073	57 48 16	3069	59 17 4	3064
	SPICA	E.	79 55 14	3092	78 26 55	3089	76 58 33	3086	75 30 6	3083
31	SUN	W.	123 35 38	3423	124 57 28	3417	126 19 25	3410	127 41 30	3404
	ALDEBARAN	W.	66 42 33	3037	68 12 0	3030	69 41 36	3023	71 11 20	3016
	SPICA	E.	68 6 40	3069	66 37 41	3053	65 8 35	3048	63 39 22	3042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	SUN	W.	27 50 47	9009	29 23 3	9013	30 55 6	9094	32 26 54	9096
	POLLUX	E.	82 24 6	9511	80 43 8	9507	79 2 32	9543	77 22 19	9550
23	SUN	W.	40 1 42	3008	41 31 45	3023	43 1 30	3036	44 30 56	3054
	POLLUX	E.	69 6 51	9842	67 28 53	9858	65 51 17	9875	64 14 3	9892
24	SUN	W.	51 53 15	3139	53 20 46	3147	54 47 58	3169	56 14 52	3178
	POLLUX	E.	56 13 26	9773	54 38 23	9780	53 3 41	9805	51 29 19	9821
	REGULUS	E.	92 10 21	9708	90 35 4	9778	89 0 8	9793	87 25 31	9806
25	SUN	W.	63 24 54	3251	64 50 3	3264	66 14 57	3277	67 39 35	3290
	α Arietis	W.	34 26 54	3288	35 51 27	3264	37 16 20	3252	38 41 28	3241
	POLLUX	E.	43 42 35	9297	42 10 12	9219	40 38 9	9297	39 6 25	9242
	SATURN	E.	79 20 52	9253	77 47 33	9266	76 14 30	9279	74 41 44	9291
	REGULUS	E.	79 37 7	9278	78 4 20	9290	76 31 49	9294	74 59 35	9216
26	SUN	W.	74 39 8	3349	76 2 23	3360	77 25 25	3370	78 48 16	3379
	α Arietis	W.	45 49 38	3213	47 15 32	3210	48 41 29	3209	50 7 27	3208
	POLLUX	E.	31 32 16	3014	30 2 20	3029	28 32 43	3045	27 3 26	3022
	SATURN	E.	67 1 40	9247	65 30 21	9257	63 59 15	9267	62 28 21	9276
	REGULUS	E.	67 22 13	9272	65 51 27	9283	64 20 53	9293	62 50 32	3022
27	SUN	W.	85 39 56	3421	87 1 49	3427	88 23 35	3434	89 45 13	3439
	α Arietis	W.	57 17 23	3209	58 43 21	3210	60 9 18	3211	61 35 14	3211
	Aldebaran	W.	25 22 10	3078	26 50 46	3079	28 19 21	3081	29 47 54	3082
	POLLUX	E.	19 42 30	3102	18 15 35	3101	16 49 15	3098	15 23 40	3075
	SATURN	E.	54 56 33	3016	53 26 40	3023	51 56 56	3029	50 27 19	3035
	REGULUS	E.	55 21 31	3043	53 52 12	3050	52 23 2	3057	50 54 0	3063
	Spica	E.	109 22 22	3060	107 53 24	3067	106 24 34	3071	104 55 49	3076
28	SUN	W.	96 31 59	3461	97 53 7	3463	99 14 12	3465	100 35 15	3468
	α Arietis	W.	68 44 48	3213	70 10 42	3212	71 36 37	3212	73 2 32	3210
	Aldebaran	W.	37 10 9	3091	38 38 30	3091	40 6 51	3091	41 35 11	3091
	SATURN	E.	43 0 50	3056	41 31 47	3060	40 2 48	3063	38 33 53	3065
	REGULUS	E.	43 30 30	3087	42 2 5	3091	40 33 44	3095	39 5 28	3096
	Spica	E.	97 33 27	3095	96 5 11	3098	94 36 57	3097	93 8 46	3099
29	SUN	W.	107 20 11	3468	108 41 11	3467	110 2 12	3465	111 23 15	3462
	α Arietis	W.	80 12 30	3203	81 38 36	3201	83 4 44	3198	84 30 56	3195
	Aldebaran	W.	48 56 56	3067	50 25 21	3065	51 53 49	3062	53 22 21	3060
	SATURN	E.	31 9 47	3071	29 41 2	3072	28 12 17	3072	26 43 33	3073
	REGULUS	E.	31 44 57	3110	30 16 59	3112	28 49 3	3114	27 21 10	3112
	Spica	E.	85 48 2	3099	84 19 53	3099	82 51 42	3097	81 23 29	3095
30	SUN	W.	118 9 20	3445	119 30 46	3440	120 52 17	3435	122 13 54	3429
	α Arietis	W.	91 42 54	3178	93 9 32	3172	94 36 15	3167	96 3 4	3162
	Aldebaran	W.	60 45 57	3060	62 14 56	3055	63 44 1	3049	65 13 13	3043
	Spica	E.	74 1 35	3079	72 33 0	3075	71 4 19	3070	69 35 33	3064
31	SUN	W.	120 3 42	3397	130 26 2	3399	131 48 31	3381	133 11 9	3374
	Aldebaran	W.	72 41 13	3009	74 11 15	3001	75 41 27	2993	77 11 49	2984
	Spica	E.	62 10 1	3038	60 40 33	3029	59 10 56	3022	57 41 11	3015

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Subtracted from Apparent Time.			
Tues.	1	h m s 0 43 6.06	9.096	N. 4 38 14.8	+57.78	16' 2.08	64.51	m s 3 54.32	s 0.758	
Wed.	2	0 46 44.43	9.101	5 1 18.9	57.56	16 1.81	64.53	3 36.20	0.753	
Thur.	3	0 50 22.93	9.107	5 24 17.6	57.33	16 1.53	64.55	3 18.20	0.747	
Frid.	4	0 54 1.58	9.113	5 47 10.5	+57.08	16 1.25	64.58	3 0.33	0.741	
Sat.	5	0 57 40.39	9.121	6 9 57.4	56.82	16 0.97	64.60	2 42.63	0.733	
SUN.	6	1 1 19.39	9.129	6 32 37.9	56.55	16 0.70	64.63	2 25.13	0.725	
Mon.	7	1 4 58.61	9.139	6 55 11.7	+56.27	16 0.42	64.66	2 7.84	0.715	
Tues.	8	1 8 38.06	9.149	7 17 38.5	55.97	16 0.14	64.70	1 50.79	0.705	
Wed.	9	1 12 17.76	9.160	7 39 57.9	55.66	15 59.86	64.73	1 33.59	0.694	
Thur.	10	1 15 57.74	9.172	8 2 9.7	+55.33	15 59.59	64.77	1 17.46	0.682	
Frid.	11	1 19 38.02	9.184	8 24 13.6	54.99	15 59.31	64.81	1 1.22	0.670	
Sat.	12	1 23 18.60	9.197	8 46 9.3	54.64	15 59.04	64.86	0 45.30	0.657	
SUN.	13	1 26 59.51	9.211	9 7 56.2	+54.27	15 58.76	64.90	0 29.70	0.643	
Mon.	14	1 30 40.76	9.226	9 29 34.1	53.89	15 58.49	64.95	0 14.44	0.628	
Tues.	15	1 34 22.37	9.241	9 51 2.9	53.50	15 58.21	65.00	0 0.46	0.613	
Wed.	16	1 38 4.35	9.257	10 12 22.0	+53.09	15 57.94	65.06	0 15.00	0.597	
Thur.	17	1 41 46.71	9.274	10 33 31.1	52.66	15 57.67	65.11	0 29.16	0.581	
Frid.	18	1 45 29.46	9.291	10 54 29.8	52.22	15 57.41	65.17	0 42.92	0.564	
Sat.	19	1 49 12.62	9.308	11 15 17.9	+51.77	15 57.15	65.23	0 56.28	0.547	
SUN.	20	1 52 56.20	9.325	11 35 54.9	51.30	15 56.89	65.29	1 9.22	0.530	
Mon.	21	1 56 40.20	9.343	11 56 20.4	50.82	15 56.63	65.35	1 21.74	0.512	
Tues.	22	2 0 24.63	9.361	12 16 34.1	+50.32	15 56.38	65.42	1 33.83	0.494	
Wed.	23	2 4 9.51	9.380	12 36 35.7	49.81	15 56.13	65.49	1 45.48	0.475	
Thur.	24	2 7 54.84	9.399	12 56 24.9	49.28	15 55.88	65.56	1 56.68	0.456	
Frid.	25	2 11 40.62	9.418	13 16 1.3	+48.74	15 55.63	65.63	2 7.41	0.437	
Sat.	26	2 15 26.88	9.438	13 35 24.4	48.18	15 55.39	65.70	2 17.67	0.417	
SUN.	27	2 19 13.63	9.458	13 54 34.1	47.62	15 55.15	65.77	2 27.45	0.397	
Mon.	28	2 23 0.86	9.478	14 13 30.0	+47.04	15 54.91	65.85	2 36.75	0.377	
Tues.	29	2 26 48.58	9.499	14 32 11.9	46.45	15 54.67	65.92	2 45.55	0.356	
Wed.	30	2 30 36.82	9.520	14 50 39.3	45.84	15 54.44	66.00	2 53.85	0.335	
Thur.	31	2 34 25.58	9.542	N.15 8 52.0	+45.21	15 54.21	66.08	3 1.63	0.313	

NOTE.—The mean time of semidiameter passing may be found by subtracting 0°.18 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.			
Tues.	1	^h 0 ^m 43 ^s 5.46	9.098	N. [°] 4 ['] 38 ["] 11.0	+57.79	^m 3 ^s 54.37	^s 0.758	^h 0 ^m 39 ^s 11.09	
Wed.	2	0 46 43.88	9.103	5 1 15.4	57.57	3 36.24	0.753	0 43 7.64	
Thur.	3	0 50 22.43	9.109	5 24 14.4	57.34	3 18.24	0.747	0 47 4.19	
Frid.	4	0 54 1.12	9.115	5 47 7.6	+57.09	3 0.37	0.741	0 51 0.75	
Sat.	5	0 57 39.97	9.123	6 9 54.8	56.83	2 42.67	0.733	0 54 57.30	
SUN.	6	1 1 19.02	9.131	6 32 35.6	56.56	2 25.16	0.725	0 58 53.86	
Mon.	7	1 4 58.29	9.141	6 55 9.7	+56.28	2 7.87	0.715	1 2 50.41	
Tues.	8	1 8 37.78	9.151	7 17 36.8	55.98	1 50.82	0.705	1 6 46.96	
Wed.	9	1 12 17.52	9.162	7 39 56.5	55.67	1 34.01	0.694	1 10 43.51	
Thur.	10	1 15 57.54	9.174	8 2 8.6	+55.34	1 17.47	0.682	1 14 40.07	
Frid.	11	1 19 37.86	9.186	8 24 12.7	55.00	1 1.23	0.670	1 18 36.62	
Sat.	12	1 23 18.48	9.199	8 46 8.6	54.65	0 45.30	0.657	1 22 33.18	
SUN.	13	1 26 59.43	9.213	9 7 55.8	+54.28	0 29.70	0.643	1 26 29.73	
Mon.	14	1 30 40.72	9.228	9 29 34.0	53.90	0 14.44	0.628	1 30 26.28	
Tues.	15	1 34 22.37	9.243	9 51 2.9	53.51	0 0.46	0.613	1 34 22.83	
Wed.	16	1 38 4.39	9.259	10 12 22.2	+53.10	0 15.00	0.597	1 38 19.39	
Thur.	17	1 41 46.78	9.275	10 33 31.5	52.67	0 29.16	0.581	1 42 15.94	
Frid.	18	1 45 29.57	9.292	10 54 30.4	52.23	0 42.93	0.564	1 46 12.50	
Sat.	19	1 49 12.77	9.309	11 15 18.6	+51.78	0 56.29	0.547	1 50 9.05	
SUN.	20	1 52 56.38	9.326	11 35 55.8	51.31	1 9.23	0.530	1 54 5.61	
Mon.	21	1 56 40.41	9.344	11 56 21.5	50.83	1 21.75	0.512	1 58 2.16	
Tues.	22	2 0 24.87	9.362	12 16 35.4	+50.33	1 33.84	0.494	2 1 58.72	
Wed.	23	2 4 9.78	9.381	12 36 37.2	49.82	1 45.49	0.475	2 5 55.27	
Thur.	24	2 7 55.14	9.400	12 56 26.5	49.29	1 56.69	0.456	2 9 51.83	
Frid.	25	2 11 40.95	9.419	13 16 3.0	+48.75	2 7.43	0.437	2 13 48.38	
Sat.	26	2 15 27.24	9.439	13 35 26.3	48.19	2 17.69	0.417	2 17 44.93	
SUN.	27	2 19 14.01	9.459	13 54 36.1	47.62	2 27.47	0.397	2 21 41.48	
Mon.	28	2 23 1.27	9.479	14 13 32.1	+47.04	2 36.77	0.377	2 25 38.04	
Tues.	29	2 26 49.02	9.500	14 32 14.0	46.45	2 45.57	0.356	2 29 34.59	
Wed.	30	2 30 37.28	9.521	14 50 41.5	45.84	2 53.87	0.335	2 33 31.15	
Thur.	31	2 34 26.06	9.543	N. 15 8 54.2	+45.31	3 1.65	0.313	2 37 27.70	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 hour,
+9°.8565.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	91	11° 43' 22.6	43° 27.9	147.80	+ 0.73	9.9999626	+51.4	23 16 59.42
2	92	12 42 28.7	42 33.9	147.71	0.78	0.0000862	51.6	23 13 3.51
3	93	13 41 32.6	41 37.7	147.63	0.80	0.0002102	51.8	23 9 7.60
4	94	14 40 34.4	40 39.4	147.53	+ 0.78	0.0003347	+52.0	23 5 11.69
5	95	15 39 34.1	39 39.0	147.44	0.74	0.0004596	52.2	23 1 15.79
6	96	16 38 31.8	38 36.6	147.36	0.67	0.0005849	52.3	22 57 19.88
7	97	17 37 27.6	37 32.3	147.28	+ 0.57	0.0007106	+52.4	22 53 23.97
8	98	18 36 21.5	36 26.1	147.21	0.46	0.0008365	52.5	22 49 28.06
9	99	19 35 13.6	35 18.1	147.13	0.33	0.0009625	52.5	22 45 32.16
10	100	20 34 4.0	34 8.3	147.06	+ 0.19	0.0010885	+52.4	22 41 36.25
11	101	21 32 52.6	32 56.8	146.99	+ 0.06	0.0012143	52.2	22 37 40.34
12	102	22 31 39.5	31 43.6	146.92	— 0.06	0.0013397	52.1	22 33 44.43
13	103	23 30 24.7	30 28.7	146.85	— 0.17	0.0014646	+51.9	22 29 48.53
14	104	24 29 8.2	29 12.1	146.77	0.26	0.0015889	51.6	22 25 52.62
15	105	25 27 49.9	27 53.7	146.70	0.33	0.0017124	51.3	22 21 56.71
16	106	26 26 29.9	26 33.6	146.63	— 0.37	0.0018350	+50.9	22 18 0.80
17	107	27 25 8.1	25 11.7	146.56	0.37	0.0019565	50.4	22 14 4.90
18	108	28 23 44.6	23 48.1	146.48	0.35	0.0020768	49.9	22 10 8.99
19	109	29 22 19.2	22 22.6	146.40	— 0.30	0.0021958	+49.4	22 6 13.08
20	110	30 20 51.9	20 55.1	146.32	0.22	0.0023135	48.8	22 2 17.18
21	111	31 19 22.6	19 25.7	146.24	— 0.12	0.0024299	48.3	21 58 21.27
22	112	32 17 51.4	17 54.4	146.15	0.00	0.0025449	+47.7	21 54 25.36
23	113	33 16 18.1	16 21.0	146.07	+ 0.13	0.0026586	47.2	21 50 29.45
24	114	34 14 42.7	14 45.5	145.98	0.27	0.0027711	46.6	21 46 33.54
25	115	35 13 5.3	13 7.9	145.90	+ 0.40	0.0028824	+46.1	21 42 37.63
26	116	36 11 25.7	11 28.2	145.81	0.52	0.0029926	45.7	21 38 41.72
27	117	37 9 44.0	9 46.4	145.73	0.62	0.0031018	45.3	21 34 45.81
28	118	38 8 0.3	8 2.6	145.64	+ 0.70	0.0032101	+45.0	21 30 49.90
29	119	39 6 14.6	6 16.7	145.56	0.75	0.0033176	44.7	21 26 54.00
30	120	40 4 26.8	4 28.8	145.47	0.77	0.0034244	44.4	21 22 58.09
31	121	41 2 37.1	2 39.0	145.39	+ 0.76	0.0035306	+44.1	21 19 2.18
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .								
Diff. for 1 Hour, — 9 ^s .8296. (Table II.)								

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	14' 56.5"	14' 59.8"	54' 43.4"	+0.94"	54' 55.5"	+1.07"	^h 9 ^m 39.4	^m 1.89	^d 11.6
2	15 3.5	15 7.5	55 9.1	1.18	55 23.9	1.28	10 24.2	1.85	12.6
3	15 11.8	15 16.3	55 39.7	1.36	55 56.2	1.39	11 8.4	1.84	13.6
4	15 20.9	15 25.5	56 13.1	+1.41	56 30.1	+1.42	11 52.8	1.87	14.6
5	15 30.2	15 34.7	56 47.1	1.40	57 3.7	1.36	12 38.1	1.93	15.6
6	15 39.0	15 43.2	57 19.7	1.31	57 35.0	1.24	13 25.5	2.03	16.6
7	15 47.2	15 50.8	57 49.5	+1.16	58 3.0	+1.08	14 15.4	2.15	17.6
8	15 54.2	15 57.3	58 15.4	0.99	58 26.7	0.90	15 8.6	2.29	18.6
9	16 0.1	16 2.5	58 36.9	0.80	58 46.0	0.71	16 5.2	2.41	19.6
10	16 4.7	16 6.6	58 54.0	+0.62	59 0.9	+0.53	17 4.4	2.49	20.6
11	16 8.2	16 9.5	59 6.8	0.44	59 11.6	0.36	18 4.8	2.50	21.6
12	16 10.5	16 11.2	59 15.2	0.26	59 17.7	+0.16	19 4.5	2.44	22.6
13	16 11.5	16 11.5	59 19.0	+0.06	59 18.9	-0.07	20 1.9	2.33	23.6
14	16 11.1	16 10.3	59 17.4	-0.19	59 14.4	0.32	20 56.4	2.21	24.6
15	16 9.0	16 7.3	59 9.8	0.46	59 3.4	0.61	21 48.0	2.11	25.6
16	16 5.0	16 2.3	58 55.2	-0.75	58 45.3	-0.90	22 37.5	2.03	26.6
17	15 59.2	15 55.5	58 33.6	1.05	58 20.1	1.19	23 25.5	1.98	27.6
18	15 51.4	15 46.9	58 5.1	1.31	57 48.7	1.42	6		28.6
19	15 42.1	15 37.1	57 31.1	-1.51	57 12.6	-1.57	0 13.0	1.98	0.2
20	15 31.9	15 26.7	56 53.5	1.60	56 34.2	1.61	1 0.8	2.02	1.2
21	15 21.4	15 16.3	56 14.9	1.59	55 56.1	1.54	1 49.4	2.04	2.2
22	15 11.4	15 6.8	55 38.1	-1.46	55 21.2	-1.36	2 39.0	2.06	3.2
23	15 2.6	14 58.8	55 5.7	1.22	54 51.9	1.08	3 29.3	2.10	4.2
24	14 55.5	14 52.9	54 39.9	0.91	54 30.1	0.72	4 19.9	2.10	5.2
25	14 50.8	14 49.4	54 22.6	-0.53	54 17.5	-0.32	5 10.1	2.07	6.2
26	14 48.8	14 48.8	54 15.0	-0.10	54 15.0	+0.11	5 59.2	2.01	7.2
27	14 49.5	14 50.9	54 17.7	+0.33	54 22.9	0.54	6 46.8	1.95	8.2
28	14 53.0	14 55.8	54 30.7	+0.75	54 40.9	+0.95	7 32.9	1.89	9.2
29	14 59.2	15 3.2	54 53.4	1.13	55 8.1	1.30	8 17.6	1.85	10.2
30	15 7.7	15 12.7	55 24.7	1.45	55 42.8	1.57	9 1.6	1.83	11.2
31	15 18.0	15 23.6	56 2.4	+1.68	56 23.1	+1.75	9 45.6	1.85	12.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	10 0 51.57	2.0087	N. 16° 46' 22.6"	9.903	0	11 35 33.86	1.9503	N. 8° 5' 16.0"	12.940
1	10 2 52.04	2.0067	16 37 8.0	9.982	1	11 37 30.87	1.9501	7 53 0.2	12.986
2	10 4 52.39	2.0049	16 27 48.7	9.361	2	11 39 27.87	1.9499	7 40 41.7	12.330
3	10 6 52.63	2.0031	16 18 24.7	9.439	3	11 41 24.86	1.9497	7 28 20.6	12.373
4	10 8 52.76	2.0012	16 8 56.0	9.516	4	11 43 21.84	1.9496	7 15 56.9	12.416
5	10 10 52.78	1.9994	15 59 22.8	9.592	5	11 45 18.81	1.9495	7 3 30.7	12.458
6	10 12 52.69	1.9976	15 49 45.0	9.668	6	11 47 15.78	1.9495	6 51 2.0	12.499
7	10 14 52.49	1.9958	15 40 2.6	9.744	7	11 49 12.75	1.9495	6 38 30.8	12.540
8	10 16 52.19	1.9941	15 30 15.7	9.818	8	11 51 9.72	1.9495	6 25 57.2	12.579
9	10 18 51.78	1.9923	15 20 24.4	9.892	9	11 53 6.69	1.9496	6 13 21.3	12.617
10	10 20 51.27	1.9906	15 10 28.7	9.965	10	11 55 3.67	1.9498	6 0 43.1	12.655
11	10 22 50.66	1.9889	15 0 28.6	10.038	11	11 57 0.66	1.9500	5 48 2.7	12.692
12	10 24 49.94	1.9872	14 50 24.1	10.111	12	11 58 57.67	1.9502	5 35 20.1	12.728
13	10 26 49.12	1.9856	14 40 15.3	10.182	13	12 0 54.69	1.9505	5 22 35.3	12.764
14	10 28 48.21	1.9841	14 30 2.2	10.253	14	12 2 51.73	1.9509	5 9 48.4	12.798
15	10 30 47.21	1.9826	14 19 44.9	10.323	15	12 4 48.80	1.9514	4 56 59.5	12.832
16	10 32 46.12	1.9810	14 9 23.4	10.392	16	12 6 45.90	1.9519	4 44 8.6	12.864
17	10 34 44.93	1.9794	13 58 57.8	10.461	17	12 8 43.03	1.9524	4 31 15.8	12.896
18	10 36 43.65	1.9779	13 48 28.1	10.529	18	12 10 40.19	1.9530	4 18 21.1	12.927
19	10 38 42.28	1.9765	13 37 54.3	10.597	19	12 12 37.39	1.9536	4 5 24.6	12.957
20	10 40 40.83	1.9751	13 27 16.5	10.664	20	12 14 34.62	1.9542	3 52 26.3	12.986
21	10 42 39.29	1.9737	13 16 34.7	10.730	21	12 16 31.89	1.9549	3 39 26.3	13.014
22	10 44 37.67	1.9723	13 5 48.9	10.795	22	12 18 29.21	1.9557	3 26 24.6	13.042
23	10 46 35.97	1.9710	N. 12° 54' 59.3"	10.859	23	12 20 26.58	1.9565	N. 3° 13' 21.3"	13.068
WEDNESDAY 2.					FRIDAY 4.				
0	10 48 34.19	1.9697	N. 12° 44' 5.8"	10.923	0	12 22 23.99	1.9573	N. 3° 0' 16.5"	13.093
1	10 50 32.33	1.9684	12 33 8.5	10.987	1	12 24 21.46	1.9582	2 47 10.2	13.118
2	10 52 30.40	1.9672	12 22 7.4	11.049	2	12 26 18.99	1.9592	2 34 2.4	13.142
3	10 54 28.40	1.9661	12 11 2.6	11.111	3	12 28 16.58	1.9604	2 20 53.2	13.164
4	10 56 26.33	1.9649	11 59 54.1	11.172	4	12 30 14.24	1.9616	2 7 42.7	13.185
5	10 58 24.19	1.9638	11 48 41.9	11.233	5	12 32 11.97	1.9627	1 54 31.0	13.205
6	11 0 21.99	1.9627	11 37 26.1	11.293	6	12 34 9.76	1.9639	1 41 18.1	13.225
7	11 2 19.72	1.9617	11 26 6.7	11.352	7	12 36 7.63	1.9651	1 28 4.0	13.244
8	11 4 17.39	1.9607	11 14 43.8	11.410	8	12 38 5.58	1.9664	1 14 48.8	13.262
9	11 6 15.01	1.9598	11 3 17.5	11.467	9	12 40 3.60	1.9677	1 1 32.5	13.279
10	11 8 12.57	1.9589	10 51 47.7	11.524	10	12 42 1.71	1.9692	0 48 15.3	13.295
11	11 10 10.07	1.9579	10 40 14.6	11.580	11	12 43 59.91	1.9707	0 34 57.1	13.310
12	11 12 7.52	1.9571	10 28 38.1	11.636	12	12 45 58.20	1.9723	0 21 38.1	13.324
13	11 14 4.93	1.9564	10 16 58.3	11.691	13	12 47 56.59	1.9739	N. 0° 8' 18.3"	13.337
14	11 16 2.29	1.9556	10 5 15.2	11.745	14	12 49 55.07	1.9755	S. 0° 5' 2.3"	13.348
15	11 17 59.60	1.9548	9 53 28.9	11.797	15	12 51 53.65	1.9772	0 18 23.5	13.358
16	11 19 56.87	1.9542	9 41 39.5	11.849	16	12 53 52.34	1.9790	0 31 45.3	13.368
17	11 21 54.10	1.9536	9 29 47.0	11.901	17	12 55 51.13	1.9808	0 45 7.7	13.377
18	11 23 51.30	1.9530	9 17 51.4	11.952	18	12 57 50.03	1.9827	0 58 30.6	13.385
19	11 25 48.46	1.9524	9 5 52.8	12.002	19	12 59 49.05	1.9847	1 11 53.9	13.392
20	11 27 45.59	1.9520	8 53 51.2	12.052	20	13 1 48.19	1.9866	1 25 17.6	13.397
21	11 29 42.70	1.9516	8 41 46.6	12.100	21	13 3 47.44	1.9886	1 38 41.6	13.402
22	11 31 39.78	1.9511	8 29 39.2	12.147	22	13 5 46.82	1.9908	1 52 5.8	13.405
23	11 33 36.83	1.9507	8 17 29.0	12.193	23	13 7 46.33	1.9930	2 5 30.2	13.408
24	11 35 33.86	1.9503	N. 8° 5' 16.0"	12.240	24	13 9 45.98	1.9952	S. 2° 18' 54.8"	13.410

GREENWICH MEAN TIME

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	h m s	a	S. o' "	"	0	h m s	a	S. o' "	"
1	13 9 45.98	1.9962	2 18 54.8	13.410	1	14 49 9.47	2.1664	8. 12 42 15.5	12.080
2	13 11 45.76	1.9975	2 32 19.4	13.410	2	14 51 19.60	2.1719	12 54 19.1	12.031
3	13 13 45.68	1.9998	2 45 44.0	13.409	3	14 53 30.02	2.1760	13 6 19.2	11.978
4	13 15 45.73	2.0021	2 59 8.5	13.407	4	14 55 40.72	2.1808	13 18 15.7	11.910
5	13 17 45.93	2.0046	3 12 32.8	13.404	5	14 57 51.72	2.1857	13 30 8.4	11.847
6	13 19 46.28	2.0072	3 25 56.9	13.400	6	15 0 3.01	2.1907	13 41 57.3	11.783
7	13 21 46.79	2.0097	3 39 20.8	13.396	7	15 2 14.60	2.1957	13 53 42.3	11.717
8	13 23 47.45	2.0123	3 52 44.3	13.388	8	15 4 26.49	2.2007	14 5 23.3	11.649
9	13 25 48.27	2.0150	4 6 7.4	13.381	9	15 6 38.68	2.2057	14 17 0.2	11.581
10	13 27 49.25	2.0177	4 19 30.0	13.372	10	15 8 51.17	2.2107	14 28 33.0	11.519
11	13 29 50.39	2.0205	4 32 52.1	13.363	11	15 11 3.96	2.2157	14 40 1.6	11.440
12	13 31 51.71	2.0234	4 46 13.6	13.352	12	15 13 17.05	2.2208	14 51 25.8	11.367
13	13 33 53.20	2.0263	4 59 34.4	13.341	13	15 15 30.45	2.2259	15 2 45.6	11.293
14	13 35 54.86	2.0293	5 12 54.5	13.328	14	15 17 44.16	2.2311	15 14 0.9	11.218
15	13 37 56.71	2.0323	5 26 13.7	13.313	15	15 19 58.18	2.2363	15 25 11.7	11.141
16	13 39 58.74	2.0353	5 39 32.0	13.298	16	15 22 12.52	2.2416	15 36 17.8	11.068
17	13 42 0.95	2.0384	5 52 49.4	13.281	17	15 24 27.17	2.2468	15 47 19.2	10.993
18	13 44 3.35	2.0416	6 6 5.7	13.262	18	15 26 42.13	2.2520	15 58 15.8	10.908
19	13 46 5.95	2.0449	6 19 20.9	13.243	19	15 28 57.41	2.2573	16 9 7.4	10.819
20	13 48 8.74	2.0483	6 32 34.9	13.223	20	15 31 13.01	2.2626	16 19 54.0	10.735
21	13 50 11.74	2.0517	6 45 47.7	13.202	21	15 33 28.93	2.2679	16 30 35.6	10.651
22	13 52 14.94	2.0550	6 58 59.2	13.180	22	15 35 45.16	2.2732	16 41 12.1	10.564
23	13 54 18.34	2.0584	7 12 9.3	13.156	23	15 38 1.71	2.2785	16 51 43.3	10.476
24	13 56 21.95	2.0620	S. 7 25 17.9	13.131		15 40 18.58	2.2839	S. 17 2 9.2	10.386
SUNDAY 6.					TUESDAY 8.				
0	h m s	a	S. o' "	"	0	h m s	a	S. o' "	"
1	13 58 25.78	2.0656	7 38 25.0	13.104	1	15 42 35.78	2.2893	8. 17 12 29.6	10.304
2	14 0 29.82	2.0692	7 51 30.4	13.076	2	15 44 53.30	2.2947	17 22 44.5	10.200
3	14 2 34.06	2.0729	8 4 34.1	13.047	3	15 47 11.14	2.3000	17 32 53.9	10.110
4	14 4 38.57	2.0767	8 17 36.1	13.018	4	15 49 29.30	2.3054	17 42 57.7	10.015
5	14 6 43.28	2.0804	8 30 36.3	12.987	5	15 51 47.79	2.3108	17 52 55.7	9.918
6	14 8 48.22	2.0842	8 43 34.6	12.955	6	15 54 6.60	2.3162	18 2 47.9	9.821
7	14 10 53.38	2.0880	8 56 30.9	12.921	7	15 56 25.73	2.3215	18 12 34.2	9.722
8	14 12 58.78	2.0920	9 9 25.1	12.885	8	15 58 45.18	2.3269	18 22 14.5	9.621
9	14 15 4.42	2.0961	9 22 17.1	12.849	9	16 1 4.96	2.3323	18 31 48.7	9.518
10	14 17 10.31	2.1003	9 35 7.0	12.812	10	16 3 25.06	2.3377	18 41 16.7	9.413
11	14 19 16.44	2.1046	9 47 54.6	12.773	11	16 5 45.48	2.3431	18 50 38.5	9.311
12	14 21 22.82	2.1083	10 0 39.8	12.732	12	16 8 6.23	2.3485	18 59 54.0	9.204
13	14 23 29.44	2.1125	10 13 22.5	12.691	13	16 10 27.30	2.3538	19 9 3.0	9.096
14	14 25 36.32	2.1167	10 26 2.7	12.649	14	16 12 48.63	2.3592	19 18 5.5	8.987
15	14 27 43.45	2.1210	10 38 40.4	12.605	15	16 15 10.40	2.3645	19 27 1.5	8.878
16	14 29 50.84	2.1253	10 51 15.3	12.559	16	16 17 32.43	2.3697	19 35 50.9	8.767
17	14 31 58.49	2.1297	11 3 47.4	12.512	17	16 19 54.77	2.3750	19 44 33.3	8.654
18	14 34 6.41	2.1342	11 16 16.7	12.464	18	16 22 17.43	2.3803	19 53 9.3	8.540
19	14 36 14.60	2.1387	11 28 43.1	12.415	19	16 24 40.41	2.3856	20 1 38.3	8.425
20	14 38 23.06	2.1432	11 41 6.5	12.364	20	16 27 3.70	2.3908	20 10 0.3	8.308
21	14 40 31.79	2.1477	11 53 26.8	12.312	21	16 29 27.31	2.3961	20 18 15.2	8.189
22	14 42 40.79	2.1523	12 5 43.9	12.256	22	16 31 51.23	2.4013	20 26 23.0	8.070
23	14 44 50.07	2.1570	12 17 57.8	12.204	23	16 34 15.46	2.4065	20 34 23.6	7.949
24	14 46 59.63	2.1617	12 30 8.4	12.147		16 36 39.89	2.4114	20 42 16.9	7.827
	14 49 9.47	2.1664	S. 12 42 15.5	12.090	24	16 39 4.83	2.4165	S. 20 50 2.8	7.703

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	^h 16 ^m 39 ^s 4.83	2.4185	S. 20° 50' 2.8	7.703	0	^h 18 ^m 39 ^s 43.29	2.5772	S. 24° 17' 34.1	0.625
1	16 41 20.98	2.4216	20 57 41.3	7.579	1	18 42 17.95	2.5781	24 18 6.7	0.469
2	16 43 55.42	2.4265	21 5 12.3	7.454	2	18 44 52.66	2.5788	24 18 29.5	0.299
3	16 46 21.16	2.4314	21 12 35.8	7.327	3	18 47 27.41	2.5795	24 18 42.5	- 0.135
4	16 48 47.19	2.4363	21 19 51.6	7.199	4	18 50 2.20	2.5801	24 18 45.7	+ 0.092
5	16 51 13.52	2.4412	21 26 59.7	7.069	5	18 52 37.02	2.5806	24 18 39.1	0.191
6	16 53 40.14	2.4460	21 33 59.9	6.938	6	18 55 11.87	2.5810	24 18 22.8	0.354
7	16 56 7.04	2.4508	21 40 52.3	6.807	7	18 57 46.74	2.5812	24 17 56.6	0.518
8	16 58 34.23	2.4555	21 47 36.8	6.675	8	19 0 21.62	2.5813	24 17 20.6	0.682
9	17 1 1.70	2.4601	21 54 13.3	6.541	9	19 2 56.50	2.5812	24 16 34.8	0.846
10	17 3 29.44	2.4647	22 0 41.7	6.405	10	19 5 31.37	2.5811	24 15 39.1	1.009
11	17 5 57.46	2.4693	22 7 1.9	6.269	11	19 8 6.23	2.5808	24 14 33.7	1.172
12	17 8 25.75	2.4738	22 13 13.9	6.132	12	19 10 41.07	2.5805	24 13 18.5	1.335
13	17 10 54.31	2.4782	22 19 17.7	5.993	13	19 13 15.89	2.5800	24 11 53.5	1.498
14	17 13 23.13	2.4824	22 25 13.1	5.853	14	19 15 50.67	2.5793	24 10 18.7	1.662
15	17 15 52.20	2.4867	22 31 0.1	5.713	15	19 18 25.41	2.5786	24 8 34.1	1.825
16	17 18 21.53	2.4909	22 36 38.7	5.572	16	19 21 0.11	2.5778	24 6 39.7	1.987
17	17 20 51.11	2.4950	22 42 8.7	5.429	17	19 23 34.75	2.5768	24 4 35.6	2.149
18	17 23 20.93	2.4990	22 47 30.1	5.285	18	19 26 9.33	2.5757	24 2 21.8	2.311
19	17 25 50.99	2.5030	22 52 42.9	5.141	19	19 28 43.84	2.5746	23 59 58.2	2.473
20	17 28 21.29	2.5070	22 57 47.0	4.995	20	19 31 18.28	2.5733	23 57 25.0	2.634
21	17 30 51.83	2.5108	23 2 42.3	4.848	21	19 33 52.64	2.5719	23 54 42.1	2.796
22	17 33 22.59	2.5145	23 7 28.8	4.701	22	19 36 26.91	2.5704	23 51 49.5	2.957
23	17 35 53.57	2.5181	S. 23 12 6.5	4.553	23	19 39 1.09	2.5688	S. 23 48 47.3	3.117
THURSDAY 10.					SATURDAY 12.				
0	17 38 24.76	2.5216	S. 23 16 35.2	4.403	0	19 41 35.17	2.5671	S. 23 45 35.5	3.277
1	17 40 56.16	2.5251	23 20 54.9	4.263	1	19 44 9.14	2.5652	23 42 14.1	3.436
2	17 43 27.77	2.5286	23 25 5.6	4.109	2	19 46 43.00	2.5633	23 38 43.2	3.594
3	17 45 59.59	2.5319	23 29 7.2	3.951	3	19 49 16.74	2.5612	23 35 2.8	3.752
4	17 48 31.60	2.5351	23 32 59.7	3.799	4	19 51 50.35	2.5591	23 31 12.9	3.910
5	17 51 3.80	2.5382	23 36 43.0	3.646	5	19 54 23.83	2.5568	23 27 13.6	4.067
6	17 53 36.18	2.5411	23 40 17.2	3.492	6	19 56 57.17	2.5545	23 23 4.8	4.224
7	17 56 8.73	2.5440	23 43 42.1	3.337	7	19 59 30.37	2.5521	23 18 46.7	4.379
8	17 58 41.46	2.5469	23 46 57.7	3.182	8	20 2 3.42	2.5496	23 14 19.3	4.534
9	18 1 14.36	2.5497	23 50 3.9	3.026	9	20 4 36.32	2.5470	23 9 42.6	4.689
10	18 3 47.42	2.5523	23 53 0.8	2.869	10	20 7 9.06	2.5442	23 4 56.6	4.843
11	18 6 20.63	2.5547	23 55 48.2	2.712	11	20 9 41.63	2.5413	23 0 1.4	4.997
12	18 8 53.98	2.5570	23 58 26.2	2.554	12	20 12 14.02	2.5384	22 54 57.0	5.149
13	18 11 27.47	2.5593	24 0 54.7	2.396	13	20 14 46.24	2.5355	22 49 43.5	5.300
14	18 14 1.10	2.5616	24 3 13.7	2.237	14	20 17 18.28	2.5324	22 44 21.0	5.450
15	18 16 34.86	2.5637	24 5 23.2	2.078	15	20 19 50.13	2.5292	22 38 49.5	5.600
16	18 19 8.74	2.5656	24 7 23.1	1.918	16	20 22 21.79	2.5260	22 33 9.0	5.749
17	18 21 42.73	2.5674	24 9 13.3	1.757	17	20 24 53.25	2.5227	22 27 19.6	5.897
18	18 24 16.83	2.5692	24 10 53.9	1.596	18	20 27 24.52	2.5194	22 21 21.3	6.045
19	18 26 51.03	2.5708	24 12 24.8	1.435	19	20 29 55.58	2.5159	22 15 14.2	6.191
20	18 29 25.32	2.5723	24 13 46.1	1.274	20	20 32 26.42	2.5123	22 8 58.4	6.336
21	18 31 59.70	2.5737	24 14 57.7	1.112	21	20 34 57.05	2.5087	22 2 33.9	6.481
22	18 34 34.16	2.5749	24 15 59.6	0.950	22	20 37 27.46	2.5050	21 56 0.7	6.624
23	18 37 8.69	2.5761	24 16 51.7	0.787	23	20 39 57.65	2.5013	21 49 19.0	6.768
24	18 39 43.29	2.5772	S. 24 17 34.1	0.625	24	20 42 27.62	2.4976	S. 21 42 28.8	6.908

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	^h 20 ^m 42 ^s 27.62	2.4976	S. 21° 42' 26.8	6.908	0	^h 22 ^m 37 ^s 15.25	2.9812	S. 13° 51' 4.7	12.980
1	20 44 57.36	2.4937	21 35 30.1	7.048	1	22 39 31.99	2.9768	13 38 49.2	12.986
2	20 47 26.86	2.4897	21 28 23.0	7.187	2	22 41 48.47	2.9724	13 26 29.2	12.970
3	20 49 56.12	2.4857	21 21 7.6	7.325	3	22 44 4.68	2.9680	13 14 4.8	12.443
4	20 52 25.14	2.4817	21 13 44.0	7.463	4	22 46 20.63	2.9637	13 1 36.0	12.516
5	20 54 53.92	2.4776	21 6 12.2	7.597	5	22 48 36.33	2.9595	12 49 2.9	12.587
6	20 57 22.45	2.4734	20 58 32.3	7.732	6	22 50 51.77	2.9553	12 36 25.6	12.656
7	20 59 50.73	2.4692	20 50 44.4	7.866	7	22 53 6.96	2.9511	12 23 44.2	12.723
8	21 2 18.76	2.4650	20 42 48.4	7.999	8	22 55 21.90	2.9469	12 10 58.8	12.789
9	21 4 46.53	2.4607	20 34 44.5	8.131	9	22 57 36.58	2.9427	11 58 9.5	12.854
10	21 7 14.04	2.4563	20 26 32.7	8.261	10	22 59 51.02	2.9386	11 45 16.3	12.917
11	21 9 41.29	2.4520	20 18 13.2	8.389	11	23 2 5.21	2.9345	11 32 19.4	12.978
12	21 12 8.28	2.4476	20 9 46.0	8.517	12	23 4 19.16	2.9305	11 19 18.9	13.038
13	21 14 35.00	2.4431	20 1 11.2	8.643	13	23 6 32.87	2.9266	11 6 14.8	13.097
14	21 17 1.45	2.4387	19 52 28.8	8.769	14	23 8 46.35	2.9227	10 53 7.2	13.155
15	21 19 27.64	2.4342	19 43 38.9	8.893	15	23 10 59.59	2.9188	10 39 56.2	13.211
16	21 21 53.56	2.4296	19 34 41.6	9.016	16	23 13 12.60	2.9149	10 26 41.9	13.265
17	21 24 19.20	2.4250	19 25 37.0	9.137	17	23 15 25.38	2.9111	10 13 24.4	13.318
18	21 26 44.56	2.4204	19 16 25.1	9.257	18	23 17 37.94	2.9074	10 0 3.7	13.370
19	21 29 9.65	2.4158	19 7 6.1	9.376	19	23 19 50.27	2.9037	9 46 40.0	13.419
20	21 31 34.46	2.4113	18 57 40.0	9.494	20	23 22 2.38	2.9001	9 33 13.4	13.467
21	21 33 59.00	2.4067	18 48 6.8	9.611	21	23 24 14.28	2.8965	9 19 43.9	12.515
22	21 36 23.26	2.4020	18 38 26.7	9.725	22	23 26 25.96	2.8929	9 6 11.6	12.561
23	21 38 47.94	2.3972	S. 18 28 39.8	9.838	23	23 28 37.43	2.8894	S. 8 52 36.6	12.604
MONDAY 14.					WEDNESDAY 16.				
0	21 41 10.93	2.3925	S. 18 18 46.1	9.951	0	23 30 48.69	2.8860	S. 8 38 59.1	12.646
1	21 43 34.34	2.3878	18 8 45.7	10.069	1	23 32 59.75	2.8826	8 25 19.1	12.687
2	21 45 57.47	2.3830	17 58 38.7	10.171	2	23 35 10.60	2.8792	8 11 36.6	12.728
3	21 48 20.32	2.3785	17 48 25.2	10.279	3	23 37 21.25	2.8759	7 57 51.7	12.767
4	21 50 42.89	2.3737	17 38 5.2	10.386	4	23 39 31.71	2.8727	7 44 4.6	12.803
5	21 53 5.17	2.3690	17 27 38.9	10.490	5	23 41 41.97	2.8694	7 30 15.3	12.839
6	21 55 27.17	2.3643	17 17 6.4	10.593	6	23 43 52.04	2.8662	7 16 23.9	12.873
7	21 57 48.89	2.3596	17 6 27.7	10.696	7	23 46 1.92	2.8630	7 2 30.5	12.906
8	22 0 10.32	2.3548	16 55 42.8	10.798	8	23 48 11.62	2.8600	6 48 35.2	12.937
9	22 2 31.47	2.3501	16 44 51.9	10.898	9	23 50 21.14	2.8573	6 34 38.1	12.967
10	22 4 52.34	2.3454	16 33 55.1	10.996	10	23 52 30.49	2.8544	6 20 39.2	12.996
11	22 7 12.92	2.3407	16 22 52.4	11.093	11	23 54 39.67	2.8516	6 6 38.7	13.021
12	22 9 33.22	2.3360	16 11 44.0	11.188	12	23 56 48.68	2.8488	5 52 36.7	13.046
13	22 11 53.24	2.3313	16 0 29.9	11.282	13	23 58 57.52	2.8460	5 38 33.2	13.071
14	22 14 12.98	2.3267	15 49 10.2	11.374	14	0 1 6.20	2.8432	5 24 28.2	13.094
15	22 16 32.44	2.3221	15 37 45.0	11.465	15	0 3 14.71	2.8405	5 10 21.9	13.115
16	22 18 51.63	2.3175	15 26 14.4	11.555	16	0 5 23.06	2.8379	4 56 14.4	13.135
17	22 21 10.54	2.3129	15 14 38.4	11.643	17	0 7 31.26	2.8355	4 42 5.7	13.153
18	22 23 29.17	2.3082	15 2 57.2	11.730	18	0 9 39.32	2.8331	4 27 56.0	13.170
19	22 25 47.53	2.3037	14 51 10.8	11.815	19	0 11 47.23	2.8306	4 13 45.3	13.186
20	22 28 5.62	2.2992	14 39 19.4	11.898	20	0 13 54.99	2.8282	3 59 33.7	13.201
21	22 30 23.43	2.2946	14 27 23.0	11.981	21	0 16 2.61	2.8259	3 45 21.2	13.214
22	22 32 40.97	2.2901	14 15 21.7	12.062	22	0 18 10.10	2.8237	3 31 8.0	13.225
23	22 34 58.24	2.2857	14 3 15.6	12.142	23	0 20 17.46	2.8215	3 16 54.2	13.235
24	22 37 15.25	2.2812	S. 13 51 4.7	12.220	24	0 22 24.68	2.8193	S. 3 2 39.8	13.244

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	^h 0 ^m 22 ^s 24.68	2.1193	S. 3° 2' 39".8	14.944	0	^h 2 ^m 2 ^s 45.97	2.0896	N. 8° 6' 35".3	13.167
1	0 24 31.78	2.1173	2 48 24.9	14.952	1	2 4 50.94	2.0830	8 19 43.8	13.116
2	0 26 38.76	2.1153	2 34 9.6	14.958	2	2 6 55.93	2.0834	8 32 49.2	13.064
3	0 28 45.62	2.1134	2 19 54.0	14.963	3	2 9 0.95	2.0839	8 45 51.5	13.011
4	0 30 52.37	2.1115	2 5 38.1	14.967	4	2 11 6.00	2.0845	8 58 50.5	12.958
5	0 32 59.00	2.1096	1 51 22.0	14.968	5	2 13 11.09	2.0851	9 11 46.2	12.901
6	0 35 5.52	2.1078	1 37 5.9	14.968	6	2 15 16.22	2.0858	9 24 38.6	12.844
7	0 37 11.94	2.1062	1 22 49.8	14.968	7	2 17 21.39	2.0866	9 37 27.5	12.786
8	0 39 18.26	2.1046	1 8 33.7	14.967	8	2 19 26.61	2.0873	9 50 12.9	12.727
9	0 41 24.49	2.1030	0 54 17.7	14.964	9	2 21 31.87	2.0881	10 2 54.7	12.667
10	0 43 30.62	2.1014	0 40' 2.0	14.959	10	2 23 37.18	2.0888	10 15 32.9	12.606
11	0 45 36.65	2.0998	0 25 46.6	14.953	11	2 25 42.53	2.0896	10 28 7.4	12.544
12	0 47 42.59	2.0983	S. 0 11 31.6	14.946	12	2 27 47.93	2.0905	10 40 38.2	12.482
13	0 49 48.45	2.0970	N. 0 2 42.9	14.937	13	2 29 53.39	2.0915	10 53 5.2	12.419
14	0 51 54.23	2.0957	0 16 56.9	14.938	14	2 31 58.91	2.0924	11 5 28.3	12.353
15	0 53 59.94	2.0945	0 31 10.3	14.917	15	2 34 4.48	2.0933	11 17 47.5	12.287
16	0 56 5.57	2.0933	0 45 23.0	14.905	16	2 36 10.11	2.0944	11 30 2.7	12.219
17	0 58 11.13	2.0921	0 59 34.9	14.191	17	2 38 15.81	2.0955	11 42 13.8	12.151
18	1 0 16.62	2.0910	1 13 45.9	14.176	18	2 40 21.57	2.0965	11 54 20.8	12.082
19	1 2 22.05	2.0900	1 27 56.0	14.160	19	2 42 27.39	2.0976	12 6 23.7	12.013
20	1 4 27.42	2.0890	1 42 5.1	14.142	20	2 44 33.28	2.0987	12 18 22.4	11.942
21	1 6 32.73	2.0880	1 56 13.1	14.124	21	2 46 39.24	2.0999	12 30 16.8	11.871
22	1 8 37.98	2.0872	2 10 20.0	14.105	22	2 48 45.27	2.1011	12 42 6.9	11.798
23	1 10 43.19	2.0864	N. 2 24 25.7	14.083	23	2 50 51.37	2.1023	N. 12 53 52.6	11.724
FRIDAY 18.					SUNDAY 20.				
0	1 12 48.35	2.0857	N. 2 38 30.0	14.060	0	2 52 57.55	2.1036	N. 13 5 33.8	11.649
1	1 14 53.47	2.0849	2 52 32.9	14.037	1	2 55 3.80	2.1048	13 17 10.5	11.574
2	1 16 58.54	2.0843	3 6 34.4	14.019	2	2 57 10.13	2.1061	13 28 42.7	11.496
3	1 19 3.57	2.0836	3 20 34.4	13.987	3	2 59 16.53	2.1074	13 40 10.3	11.421
4	1 21 8.57	2.0831	3 34 32.9	13.960	4	3 1 23.01	2.1087	13 51 33.2	11.343
5	1 23 13.54	2.0826	3 48 29.6	13.930	5	3 3 29.57	2.1101	14 2 51.4	11.264
6	1 25 18.48	2.0822	4 2 24.5	13.900	6	3 5 36.22	2.1115	14 14 4.9	11.184
7	1 27 23.40	2.0818	4 16 17.6	13.870	7	3 7 42.95	2.1128	14 25 13.5	11.103
8	1 29 28.29	2.0814	4 30 8.9	13.838	8	3 9 49.76	2.1142	14 36 17.2	11.021
9	1 31 33.16	2.0811	4 43 58.2	13.805	9	3 11 56.66	2.1156	14 47 16.0	10.939
10	1 33 38.02	2.0808	4 57 45.5	13.771	10	3 14 3.64	2.1170	14 58 9.9	10.857
11	1 35 42.86	2.0806	5 11 30.7	13.738	11	3 16 10.71	2.1186	15 8 58.8	10.773
12	1 37 47.69	2.0805	5 25 13.7	13.697	12	3 18 17.87	2.1201	15 19 42.6	10.687
13	1 39 52.52	2.0804	5 38 54.4	13.659	13	3 20 25.12	2.1216	15 30 21.2	10.601
14	1 41 57.34	2.0803	5 52 32.8	13.621	14	3 22 32.46	2.1230	15 40 54.7	10.515
15	1 44 2.16	2.0803	6 6 8.9	13.589	15	3 24 39.88	2.1245	15 51 23.0	10.427
16	1 46 6.98	2.0804	6 19 42.6	13.540	16	3 26 47.40	2.1261	16 1 46.0	10.339
17	1 48 11.81	2.0806	6 33 13.7	13.497	17	3 28 55.01	2.1276	16 12 3.7	10.250
18	1 50 16.65	2.0807	6 46 42.2	13.453	18	3 31 2.71	2.1292	16 22 16.0	10.160
19	1 52 21.50	2.0809	7 0 8.0	13.408	19	3 33 10.51	2.1307	16 32 22.9	10.069
20	1 54 26.36	2.0811	7 13 31.1	13.363	20	3 35 18.40	2.1323	16 42 24.3	9.978
21	1 56 31.23	2.0813	7 26 51.5	13.317	21	3 37 26.38	2.1338	16 52 20.3	9.886
22	1 58 36.12	2.0817	7 40 9.1	13.268	22	3 39 34.46	2.1354	17 2 10.7	9.793
23	2 0 41.03	2.0821	7 53 23.7	13.218	23	3 41 42.63	2.1369	17 11 55.5	9.700
24	2 2 45.97	2.0826	N. 8 6 35.3	13.167	24	3 43 50.89	2.1385	N. 17 21 34.7	9.606

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	3 43 50.89	2.1385	N.17° 21' 34.7"	9.806	0	5 28 8.17	2.1987	N.23° 2' 39.6"	4.483
1	3 45 59.25	2.1401	17 31 8.2	9.511	1	5 30 20.11	2.1993	23 7 1.5	4.308
2	3 48 7.70	2.1417	17 40 36.0	9.415	2	5 32 32.08	2.1999	23 11 16.3	4.186
3	3 50 16.25	2.1433	17 49 58.0	9.319	3	5 34 44.09	2.2004	23 15 24.0	4.069
4	3 52 24.89	2.1448	17 59 14.3	9.222	4	5 36 56.13	2.2008	23 19 24.6	3.951
5	3 54 33.63	2.1465	18 8 24.7	9.124	5	5 39 8.19	2.2012	23 23 18.1	3.833
6	3 56 42.47	2.1481	18 17 29.2	9.026	6	5 41 20.27	2.2015	23 27 4.6	3.715
7	3 58 51.40	2.1496	18 26 27.8	8.927	7	5 43 32.37	2.2018	23 30 43.9	3.598
8	4 1 0.42	2.1512	18 35 20.4	8.827	8	5 45 44.49	2.2021	23 34 16.1	3.477
9	4 3 9.54	2.1527	18 44 7.1	8.727	9	5 47 56.63	2.2024	23 37 41.2	3.358
10	4 5 18.75	2.1542	18 52 47.7	8.626	10	5 50 8.78	2.2026	23 40 59.1	3.239
11	4 7 28.05	2.1557	19 1 22.2	8.524	11	5 52 20.94	2.2027	23 44 9.9	3.121
12	4 9 37.44	2.1572	19 9 50.6	8.422	12	5 54 33.10	2.2028	23 47 13.6	3.002
13	4 11 46.92	2.1586	19 18 12.8	8.319	13	5 56 45.27	2.2028	23 50 10.1	2.882
14	4 13 56.50	2.1604	19 26 28.8	8.216	14	5 58 57.44	2.2028	23 52 59.4	2.762
15	4 16 6.17	2.1619	19 34 38.7	8.112	15	6 1 9.61	2.2028	23 55 41.6	2.643
16	4 18 15.93	2.1634	19 42 42.3	8.007	16	6 3 21.78	2.2027	23 58 16.6	2.524
17	4 20 25.78	2.1648	19 50 39.6	7.902	17	6 5 33.94	2.2026	24 0 44.5	2.405
18	4 22 35.71	2.1662	19 58 30.6	7.797	18	6 7 46.09	2.2024	24 3 5.2	2.285
19	4 24 45.73	2.1677	20 6 15.2	7.690	19	6 9 58.23	2.2022	24 5 18.7	2.165
20	4 26 55.84	2.1692	20 13 53.4	7.583	20	6 12 10.36	2.2020	24 7 25.0	2.046
21	4 29 6.03	2.1706	20 21 25.2	7.476	21	6 14 22.47	2.2017	24 9 24.2	1.927
22	4 31 16.31	2.1720	20 28 50.6	7.369	22	6 16 34.56	2.2013	24 11 16.2	1.807
23	4 33 26.67	2.1733	N.20 36 9.5	7.261	23	6 18 46.62	2.2008	N.24 13 1.0	1.687
TUESDAY 22.					THURSDAY 24.				
0	4 35 37.11	2.1747	N.20 43 21.9	7.158	0	6 20 58.66	2.2004	N.24 14 38.7	1.568
1	4 37 47.63	2.1760	20 50 27.7	7.042	1	6 23 10.67	2.1999	24 16 9.2	1.448
2	4 39 58.23	2.1773	20 57 27.0	6.923	2	6 25 22.65	2.1994	24 17 32.5	1.328
3	4 42 8.91	2.1786	21 4 19.7	6.803	3	6 27 34.60	2.1988	24 18 48.6	1.209
4	4 44 19.67	2.1799	21 11 5.7	6.712	4	6 29 46.51	2.1981	24 19 57.6	1.091
5	4 46 30.50	2.1811	21 17 45.1	6.601	5	6 31 58.38	2.1974	24 20 59.5	0.972
6	4 48 41.40	2.1824	21 24 17.8	6.489	6	6 34 10.20	2.1967	24 21 54.2	0.852
7	4 50 52.38	2.1836	21 30 43.8	6.377	7	6 36 21.98	2.1959	24 22 41.8	0.733
8	4 53 3.43	2.1847	21 37 3.1	6.265	8	6 38 33.71	2.1951	24 23 22.2	0.614
9	4 55 14.54	2.1857	21 43 15.6	6.153	9	6 40 45.39	2.1942	24 23 55.5	0.496
10	4 57 25.72	2.1868	21 49 21.4	6.040	10	6 42 57.02	2.1933	24 24 21.7	0.377
11	4 59 36.96	2.1879	21 55 20.4	5.926	11	6 45 8.59	2.1923	24 24 40.8	0.258
12	5 1 48.27	2.1890	22 1 12.5	5.812	12	6 47 20.10	2.1913	24 24 52.7	0.140
13	5 3 59.64	2.1900	22 6 57.8	5.698	13	6 49 31.55	2.1902	24 24 57.6	+ 0.022
14	5 6 11.07	2.1909	22 12 36.3	5.584	14	6 51 42.93	2.1890	24 24 55.4	- 0.096
15	5 8 22.55	2.1918	22 18 7.9	5.469	15	6 53 54.25	2.1881	24 24 46.1	0.214
16	5 10 34.09	2.1926	22 23 32.6	5.354	16	6 56 5.50	2.1869	24 24 29.7	0.331
17	5 12 45.69	2.1937	22 28 50.4	5.238	17	6 58 16.68	2.1857	24 24 6.3	0.446
18	5 14 57.34	2.1946	22 34 1.2	5.123	18	7 0 27.78	2.1844	24 23 35.9	0.565
19	5 17 9.04	2.1954	22 39 5.1	5.007	19	7 2 38.80	2.1830	24 22 58.5	0.682
20	5 19 20.78	2.1961	22 44 2.0	4.890	20	7 4 49.74	2.1817	24 22 14.0	0.800
21	5 21 32.57	2.1968	22 48 51.9	4.773	21	7 7 0.61	2.1804	24 21 22.5	0.917
22	5 23 44.40	2.1975	22 53 34.8	4.657	22	7 9 11.39	2.1789	24 20 24.0	1.033
23	5 25 56.27	2.1981	22 58 10.7	4.540	23	7 11 22.08	2.1774	24 19 18.6	1.148
24	5 28 8.17	2.1987	N.23 2 39.6	4.423	24	7 13 32.68	2.1759	N.24 18 6.2	1.264

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	7 ^h 13 ^m 32.68	2.1759	N.24° 18' 6.2"	1.384	0	8 ^h 55 ^m 38.72	2.0702	N.21° 10' 37.6"	6.387
1	7 15 43.19	2.1743	24 16 46.9	1.379	1	8 57 42.85	2.0676	21 4 11.5	6.482
2	7 17 53.60	2.1728	24 15 20.7	1.495	2	8 59 46.83	2.0651	20 57 39.7	6.578
3	7 20 3.92	2.1712	24 13 47.5	1.611	3	9 1 50.66	2.0626	20 51 2.1	6.673
4	7 22 14.14	2.1694	24 12 7.4	1.725	4	9 3 54.34	2.0600	20 44 18.9	6.767
5	7 24 24.25	2.1677	24 10 20.5	1.838	5	9 5 57.86	2.0574	20 37 30.1	6.860
6	7 26 34.26	2.1659	24 8 26.8	1.952	6	9 8 1.23	2.0549	20 30 35.7	6.953
7	7 28 44.16	2.1642	24 6 26.2	2.066	7	9 10 4.45	2.0524	20 23 35.7	7.046
8	7 30 53.96	2.1624	24 4 18.8	2.180	8	9 12 7.52	2.0499	20 16 30.2	7.138
9	7 33 3.65	2.1605	24 2 4.6	2.293	9	9 14 10.44	2.0474	20 9 19.2	7.229
10	7 35 13.22	2.1586	23 59 43.6	2.406	10	9 16 13.21	2.0449	20 2 2.7	7.320
11	7 37 22.68	2.1567	23 57 15.9	2.518	11	9 18 15.83	2.0424	19 54 40.8	7.410
12	7 39 32.03	2.1548	23 54 41.5	2.630	12	9 20 18.30	2.0399	19 47 13.5	7.500
13	7 41 41.26	2.1528	23 52 0.3	2.742	13	9 22 20.62	2.0375	19 39 40.8	7.589
14	7 43 50.37	2.1507	23 49 12.4	2.853	14	9 24 22.80	2.0351	19 32 2.8	7.677
15	7 45 59.35	2.1487	23 46 17.9	2.963	15	9 26 24.83	2.0326	19 24 19.5	7.766
16	7 48 8.21	2.1467	23 43 16.8	3.074	16	9 28 26.71	2.0302	19 16 30.9	7.853
17	7 50 16.95	2.1446	23 40 9.0	3.185	17	9 30 28.45	2.0277	19 8 37.1	7.940
18	7 52 25.56	2.1424	23 36 54.6	3.295	18	9 32 30.04	2.0253	19 0 38.1	8.026
19	7 54 34.04	2.1402	23 33 33.6	3.404	19	9 34 31.49	2.0230	18 52 33.9	8.112
20	7 56 42.39	2.1381	23 30 6.1	3.513	20	9 36 32.80	2.0206	18 44 24.6	8.198
21	7 58 50.61	2.1359	23 26 32.0	3.622	21	9 38 33.96	2.0182	18 36 10.1	8.284
22	8 0 58.70	2.1337	23 22 51.4	3.731	22	9 40 34.98	2.0159	18 27 50.5	8.368
23	8 3 6.66	2.1315	N.23 19 4.3	3.839	23	9 42 35.87	2.0136	N.18 19 25.9	8.451
SATURDAY 26.					MONDAY 28.				
0	8 5 14.48	2.1292	N.23 15 10.8	3.946	0	9 44 36.62	2.0113	N.18 10 56.4	8.534
1	8 7 22.16	2.1269	23 11 10.8	4.053	1	9 46 37.23	2.0091	18 2 21.9	8.617
2	8 9 29.70	2.1246	23 7 4.4	4.159	2	9 48 37.71	2.0068	17 53 42.4	8.699
3	8 11 37.11	2.1223	23 2 51.7	4.265	3	9 50 38.05	2.0046	17 44 58.0	8.781
4	8 13 44.38	2.1199	22 58 32.6	4.371	4	9 52 38.26	2.0024	17 36 8.7	8.862
5	8 15 51.50	2.1174	22 54 7.1	4.477	5	9 54 38.34	2.0003	17 27 14.6	8.942
6	8 17 58.47	2.1150	22 49 35.3	4.582	6	9 56 38.30	1.9982	17 18 15.7	9.021
7	8 20 5.30	2.1126	22 44 57.3	4.686	7	9 58 38.13	1.9961	17 9 12.1	9.100
8	8 22 11.99	2.1102	22 40 13.0	4.790	8	10 0 37.83	1.9939	17 0 3.7	9.179
9	8 24 18.53	2.1077	22 35 22.5	4.893	9	10 2 37.40	1.9918	16 50 50.6	9.257
10	8 26 24.92	2.1053	22 30 25.8	4.996	10	10 4 36.85	1.9897	16 41 32.9	9.334
11	8 28 31.17	2.1029	22 25 22.9	5.099	11	10 6 36.17	1.9877	16 32 10.5	9.411
12	8 30 37.27	2.1004	22 20 13.9	5.201	12	10 8 35.37	1.9857	16 22 43.5	9.487
13	8 32 43.22	2.0979	22 14 58.8	5.303	13	10 10 34.45	1.9836	16 13 12.0	9.562
14	8 34 49.02	2.0954	22 9 37.6	5.404	14	10 12 33.42	1.9819	16 3 36.0	9.638
15	8 36 54.67	2.0929	22 4 10.3	5.505	15	10 14 32.28	1.9801	15 53 55.4	9.713
16	8 39 0.17	2.0904	21 58 37.0	5.605	16	10 16 31.03	1.9782	15 44 10.4	9.787
17	8 41 5.52	2.0879	21 52 57.7	5.704	17	10 18 29.67	1.9764	15 34 21.0	9.860
18	8 43 10.72	2.0854	21 47 12.5	5.803	18	10 20 28.20	1.9747	15 24 27.2	9.933
19	8 45 15.77	2.0828	21 41 21.3	5.902	19	10 22 26.63	1.9729	15 14 29.0	10.006
20	8 47 20.66	2.0802	21 35 24.2	6.000	20	10 24 24.95	1.9711	15 4 26.5	10.077
21	8 49 25.40	2.0777	21 29 21.3	6.098	21	10 26 23.16	1.9694	14 54 19.8	10.147
22	8 51 29.90	2.0752	21 23 12.5	6.195	22	10 28 21.27	1.9678	14 44 8.9	10.217
23	8 53 34.43	2.0727	21 16 57.9	6.291	23	10 30 19.29	1.9662	14 33 53.8	10.287
24	8 55 38.72	2.0702	N.21 10 37.6	6.387	24	10 32 17.21	1.9646	N.14 23 34.5	10.356

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran W.	78 42 22	2975	80 13 6	2966	81 44 1	2957	83 15 6	2948
	Pollux W.	34 39 32	3007	36 9 36	2994	37 39 56	2984	39 10 29	2973
	Spica E.	56 11 17	3008	54 41 14	3000	53 11 2	2994	51 40 42	2985
	Antares E.	102 3 49	2991	100 33 25	2982	99 2 51	2973	97 32 5	2964
	MARS E.	104 0 23	3050	102 31 12	3040	101 1 48	3030	99 32 13	3020
2	Aldebaran W.	90 53 43	2898	92 26 5	2887	93 58 40	2878	95 31 29	2867
	Pollux W.	46 46 57	2914	48 18 58	2901	49 51 15	2890	51 23 47	2878
	Spica E.	44 6 38	2949	42 35 22	2943	41 3 58	2936	39 32 25	2930
	Antares E.	89 55 8	2912	88 23 5	2903	86 50 50	2893	85 18 21	2882
	MARS E.	92 1 5	2967	90 30 11	2956	88 59 4	2945	87 27 42	2934
3	Aldebaran W.	103 19 4	2810	104 53 18	2800	106 27 46	2788	108 2 29	2778
	Pollux W.	59 10 15	2819	60 44 18	2807	62 18 37	2794	63 53 12	2783
	Regulus W.	23 17 48	2859	24 50 54	2845	26 24 23	2837	27 58 15	2811
	Spica E.	31 52 59	2911	30 20 54	2909	28 48 47	2910	27 16 41	2913
	Antares E.	77 32 28	2896	75 58 34	2816	74 24 27	2805	72 50 6	2794
	MARS E.	79 47 13	2875	78 14 23	2863	76 41 17	2851	75 7 55	2839
4	Pollux W.	71 49 58	2794	73 26 6	2712	75 2 29	2700	76 39 8	2690
	SATURN W.	36 29 32	2708	38 6 1	2695	39 42 46	2682	41 19 47	2670
	Regulus W.	35 52 38	2738	37 28 27	2734	39 4 33	2711	40 40 57	2698
	Antares E.	64 54 44	2740	63 18 57	2730	61 42 56	2710	60 6 42	2710
	MARS E.	67 17 15	2779	65 42 20	2767	64 7 10	2757	62 31 44	2745
5	Pollux W.	84 46 5	2634	86 24 13	2694	88 2 35	2613	89 41 12	2603
	SATURN W.	49 28 45	2616	51 7 18	2605	52 46 6	2594	54 25 8	2584
	Regulus W.	48 47 6	2639	50 25 8	2627	52 3 25	2616	53 41 57	2605
	Antares E.	52 2 15	2662	50 24 44	2653	48 47 2	2645	47 9 9	2637
	MARS E.	54 30 45	2686	52 53 47	2675	51 16 36	2664	49 39 9	2653
	α Aquilæ E.	99 9 9	3356	97 46 2	3341	96 22 37	3325	94 58 55	3311
6	Pollux W.	97 57 39	2554	99 37 37	2545	101 17 47	2537	102 58 9	2527
	SATURN W.	62 43 51	2534	64 24 16	2525	66 4 54	2516	67 45 44	2507
	Regulus W.	61 58 17	2554	63 38 15	2544	65 18 26	2534	66 58 50	2525
	Antares E.	38 57 15	2606	37 18 29	2609	35 39 37	2598	34 0 40	2597
	MARS E.	41 28 22	2603	39 49 31	2593	38 10 26	2583	36 31 9	2574
	α Aquilæ E.	87 56 49	3260	86 31 51	3254	85 6 45	3249	83 41 32	3244
	JUPITER E.	97 35 38	2595	95 56 36	2586	94 17 22	2575	92 37 55	2566
7	SATURN W.	76 13 1	2466	77 55 2	2458	79 37 15	2450	81 19 38	2442
	Regulus W.	75 23 58	2483	77 5 35	2475	78 47 23	2467	80 29 21	2460
	MARS E.	28 11 35	2531	26 31 5	2523	24 50 23	2515	23 9 31	2507
	α Aquilæ E.	76 34 51	3245	75 9 35	3250	73 44 23	3256	72 19 20	3264
	JUPITER E.	84 17 38	2525	82 37 0	2517	80 56 11	2509	79 15 11	2503
8	SATURN W.	89 54 6	2409	91 37 27	2403	93 20 57	2397	95 4 36	2391
	Regulus W.	89 1 48	2426	90 44 45	2420	92 27 52	2414	94 11 7	2408
	Spica W.	35 18 59	2499	37 0 14	2486	38 41 47	2474	40 23 36	2464
	α Aquilæ E.	65 17 9	3334	63 53 37	3356	62 30 31	3381	61 7 53	3411
	JUPITER E.	70 47 42	2468	69 5 44	2462	67 23 37	2456	65 41 22	2450
	Fomalhaut E.	95 29 50	2598	93 50 53	2592	92 11 47	2585	90 32 32	2579

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W.	84 46 26	2938	86 17 56	2928	87 49 39	2919	89 21 35	2908
	Pollux W.	40 41 17	2960	42 12 20	2949	43 45 37	2936	45 15 10	2925
	Spica E.	50 10 11	2979	48 39 32	2971	47 8 43	2964	45 37 45	2957
	Antares E.	96 1 6	2954	94 29 56	2944	92 58 32	2934	91 26 56	2923
	Mars E.	98 2 25	3010	96 32 25	3000	95 2 11	2989	93 31 45	2978
2	Aldebaran W.	97 4 32	2956	98 37 48	2944	100 11 19	2933	101 45 4	2921
	Pollux W.	52 56 34	2987	54 29 36	2954	56 2 54	2942	57 36 27	2930
	Spica E.	38 0 44	2924	36 28 56	2919	34 57 2	2915	33 25 2	2912
	Antares E.	83 45 38	2971	82 12 42	2961	80 39 31	2950	79 6 6	2938
	Mars E.	85 56 6	2922	84 24 15	2911	82 52 9	2899	81 19 49	2887
3	Aldebaran W.	109 37 26	2785	111 12 39	2755	112 48 6	2743	114 23 48	2733
	Pollux W.	65 28 2	2771	67 3 8	2759	68 38 29	2747	70 14 6	2736
	Regulus W.	29 32 28	2795	31 7 2	2781	32 41 55	2765	34 17 8	2758
	Spica E.	25 44 41	2923	24 12 50	2932	22 41 12	2946	21 9 52	2965
	Antares E.	71 15 30	2782	69 40 39	2772	68 5 35	2762	66 30 16	2751
	Mars E.	73 34 18	2827	72 0 26	2815	70 26 18	2803	68 51 54	2791
4	Pollux W.	78 16 1	2678	79 53 10	2667	81 30 34	2657	83 8 12	2645
	SATURN W.	42 57 4	2660	44 34 37	2649	46 12 24	2638	47 50 27	2627
	Regulus W.	42 17 38	2686	43 54 36	2674	45 31 50	2662	47 9 20	2650
	Antares E.	58 30 15	2699	56 53 34	2689	55 16 40	2681	53 39 34	2671
	Mars E.	60 56 3	2732	59 20 6	2720	57 43 54	2709	56 7 27	2698
5	Pollux W.	91 20 2	2583	92 59 6	2583	94 38 24	2574	96 17 55	2564
	SATURN W.	56 4 25	2574	57 43 56	2564	59 23 40	2554	61 3 39	2544
	Regulus W.	55 20 44	2585	56 59 46	2584	58 39 2	2574	60 18 33	2564
	Antares E.	45 31 5	2629	43 52 50	2624	42 14 27	2617	40 35 55	2611
	Mars E.	48 1 28	2643	46 23 32	2633	44 45 23	2623	43 6 59	2613
	α Aquilæ E.	93 34 56	2699	92 10 43	2688	90 46 16	2677	89 21 38	2668
6	Pollux W.	104 38 44	2519	106 19 30	2511	108 0 28	2503	109 41 37	2495
	SATURN W.	69 26 48	2498	71 8 4	2490	72 49 31	2482	74 31 10	2474
	Regulus W.	68 39 27	2516	70 20 17	2507	72 1 18	2499	73 42 32	2491
	Antares E.	32 21 41	2597	30 42 43	2596	29 3 45	2590	27 24 49	2585
	Mars E.	34 51 39	2585	33 11 56	2556	31 32 1	2547	29 51 54	2539
	α Aquilæ E.	82 16 15	2641	80 50 55	2640	79 25 33	2640	78 0 11	2641
	JUPITER E.	90 58 16	2557	89 18 24	2550	87 38 21	2541	85 58 5	2533
7	SATURN W.	83 2 12	2435	84 44 56	2428	86 27 50	2421	88 10 53	2414
	Regulus W.	82 11 31	2453	83 53 50	2445	85 36 20	2438	87 18 59	2432
	Mars E.	21 28 28	2500	19 47 15	2493	18 5 52	2486	16 24 20	2479
	α Aquilæ E.	70 54 25	2374	69 29 43	2365	68 5 14	2359	66 41 2	2346
	JUPITER E.	77 34 1	2497	75 52 40	2490	74 11 10	2482	72 29 30	2475
8	SATURN W.	96 48 23	2386	98 32 18	2380	100 16 21	2375	102 0 31	2370
	Regulus W.	95 54 30	2402	97 38 2	2396	99 21 41	2391	101 5 27	2386
	Spica W.	42 5 39	2453	43 47 57	2444	45 30 29	2436	47 13 12	2428
	α Aquilæ E.	50 45 45	2442	58 24 12	2474	57 3 19	2513	55 43 9	2559
	JUPITER E.	63 58 58	2444	62 16 26	2439	60 33 47	2434	58 51 1	2429
	Fomalhaut E.	88 53 8	2574	87 13 37	2568	85 33 59	2564	83 54 15	2560

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
9	SATURN W.	110° 43' 7"	9347	112° 27' 57"	9343	114° 12' 53"	9339	115° 57' 54"	9336
	Regulus W.	109 46 4	9364	111 30 30	9360	113 15 2	9356	114 59 39	9352
	Spica W.	55 49 32	9393	57 33 16	9388	59 17 8	9381	61 1 9	9377
	JUPITER E.	50 15 27	9407	48 32 2	9403	46 48 32	9399	45 4 57	9396
	Fomalhaut E.	75 34 25	9548	73 14 19	9547	72 14 11	9547	70 34 3	9547
	SUN E.	121 59 26	9699	120 22 32	9683	118 45 30	9679	117 8 22	9674
10	Spica W.	69 42 57	9354	71 27 38	9350	73 12 24	9347	74 57 15	9344
	JUPITER E.	36 25 55	9383	34 41 56	9381	32 57 56	9380	31 13 53	9380
	Fomalhaut E.	62 13 52	9561	60 34 3	9565	58 54 20	9573	57 14 47	9579
	α Pegasi E.	80 40 24	9743	79 4 44	9747	77 29 7	9749	75 53 33	9754
	SUN E.	109 1 6	9652	107 23 22	9648	105 45 33	9645	104 7 39	9642
11	Spica W.	83 42 42	9398	85 28 0	9396	87 13 21	9394	88 58 45	9392
	Antares W.	37 53 24	9363	39 37 52	9356	41 22 30	9350	43 7 17	9344
	MARS W.	33 40 46	9341	35 25 45	9338	37 10 48	9336	38 55 54	9334
	JUPITER E.	22 33 41	9388	20 49 49	9394	19 6 6	9403	17 22 36	9400
	Fomalhaut E.	49 0 9	9638	47 22 6	9655	45 44 26	9676	44 7 14	9689
	α Pegasi E.	67 57 30	9790	66 22 49	9800	64 48 22	9814	63 14 12	9828
	SUN E.	95 57 2	9626	94 18 43	9623	92 40 20	9621	91 1 54	9619
12	Spica W.	97 46 27	9314	99 32 5	9313	101 17 45	9319	103 3 26	9319
	Antares W.	51 52 56	9323	53 38 21	9320	55 23 50	9318	57 9 23	9316
	MARS W.	47 42 18	9323	49 27 44	9321	51 13 12	9319	52 58 43	9318
	α Pegasi E.	55 28 54	9932	53 57 16	9960	52 26 14	9992	50 55 52	3029
	SUN E.	82 49 2	9610	81 10 21	9609	79 31 38	9606	77 52 53	9607
13	Spica W.	111 51 55	9313	113 37 35	9314	115 23 14	9315	117 8 52	9317
	Antares W.	65 57 52	9308	67 43 40	9307	69 29 28	9307	71 15 17	9307
	MARS W.	61 46 41	9313	63 32 21	9313	65 18 1	9313	67 3 41	9314
	α Pegasi E.	43 36 56	9964	42 12 26	9355	40 49 18	9426	39 27 43	3598
	SUN E.	69 38 56	9604	68 0 7	9604	66 21 19	9605	64 42 32	9606
14	Antares W.	80 4 20	9310	81 50 5	9311	83 35 48	9313	85 21 29	9315
	MARS W.	75 51 57	9317	77 37 32	9318	79 23 7	9319	81 8 39	9320
	SUN E.	56 28 57	9614	54 50 21	9617	53 11 49	9620	51 33 21	9623
15	Antares W.	94 8 58	9329	95 54 15	9333	97 39 25	9337	99 24 29	9341
	MARS W.	89 55 33	9333	91 40 44	9336	93 25 50	9340	95 10 51	9344
	α Aquilæ W.	53 18 32	9535	54 38 18	9482	55 59 2	9426	57 20 37	9396
	SUN E.	43 22 12	9644	41 44 17	9651	40 6 30	9656	38 28 51	9663
16	Antares W.	108 8 0	9379	109 52 18	9377	111 36 25	9384	113 20 22	9383
	α Aquilæ W.	64 18 13	9259	65 43 14	9229	67 8 37	9223	68 34 19	9207
	SUN E.	30 23 14	9708	28 46 45	9719	27 10 31	9733	25 34.35	9747
20	SUN W.	20 35 33	3104	22 3 39	3105	23 31 42	3111	24 59 38	3119
	Pollux E.	61 6 8	9689	59 29 13	9703	57 52 37	9715	56 16 18	9730
	SATURN E.	95 54 47	9673	94 17 30	9686	92 40 31	9699	91 3 50	9712
	Regulus E.	97 5 2	9683	95 27 59	9696	93 51 15	9709	92 14 47	9729
21	SUN W.	32 16 51	3185	33 43 43	3175	35 10 22	3187	36 36 47	3196

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	POLLUX	E.	54° 40' 18"	2744	53° 4' 37"	2758	51° 29' 14"	2771	49° 54' 9"	2785
	SATURN	E.	89 27 27	2725	87 51 21	2739	86 15 32	2752	84 40 1	2765
	REGULUS	E.	90 38 37	2736	89 2 45	2749	87 27 10	2762	85 51 52	2775
22	SUN	W.	38 2 59	2809	39 28 57	2821	40 54 41	2833	42 20 12	2843
	POLLUX	E.	42 3 19	2855	40 30 3	2870	38 57 6	2885	37 24 28	2899
	SATURN	E.	76 46 41	2829	75 12 51	2841	73 30 17	2853	72 5 58	2865
	REGULUS	E.	77 59 36	2839	76 25 59	2852	74 52 38	2864	73 19 32	2876
23	SUN	W.	49 24 27	3300	50 48 40	3310	52 12 40	3320	53 36 28	3330
	SATURN	E.	64 23 15	2922	62 51 25	2933	61 19 49	2944	59 48 27	2954
	REGULUS	E.	65 37 53	2933	64 6 16	2944	62 34 54	2955	61 3 44	2966
	SPICA	E.	119 36 31	2958	118 5 25	2967	116 34 31	2976	115 3 48	2985
24	SUN	W.	60 32 44	3375	61 55 29	3383	63 18 4	3391	64 40 31	3398
	ALDEBARAN	W.	27 15 2	3049	28 44 22	3046	30 13 38	3050	31 42 49	3054
	SATURN	E.	52 14 38	3000	50 44 26	3008	49 14 25	3016	47 44 33	3024
	REGULUS	E.	53 31 5	3012	52 1 8	3021	50 31 21	3029	49 1 45	3037
	SPICA	E.	107 32 57	3026	106 3 17	3034	104 33 46	3041	103 4 23	3048
25	SUN	W.	71 30 51	3428	72 52 36	3432	74 14 16	3436	75 35 52	3440
	ALDEBARAN	W.	39 7 36	3071	40 36 21	3074	42 5 2	3077	43 33 40	3079
	SATURN	E.	40 17 26	3057	38 48 24	3062	37 19 29	3065	35 50 39	3070
	REGULUS	E.	41 36 2	3079	40 7 18	3078	38 38 42	3083	37 10 13	3089
	SPICA	E.	95 39 25	3075	94 10 45	3080	92 42 10	3084	91 13 40	3087
26	SUN	W.	82 22 59	3451	83 44 18	3451	85 5 37	3451	86 26 56	3451
	ALDEBARAN	W.	50 56 18	3088	52 24 45	3087	53 53 13	3084	55 21 42	3083
	SATURN	E.	28 27 53	3099	26 50 34	3096	25 31 18	3100	24 3 7	3103
	REGULUS	E.	29 49 28	3117	28 21 39	3121	26 53 56	3125	25 26 20	3129
	SPICA	E.	83 52 2	3098	82 23 50	3098	80 55 38	3099	79 27 26	3099
27	SUN	W.	93 13 50	3440	94 35 21	3436	95 56 56	3439	97 18 36	3428
	ALDEBARAN	W.	62 44 31	3072	64 13 14	3068	65 42 2	3064	67 10 54	3060
	SPICA	E.	72 6 20	3092	70 38 1	3090	69 9 38	3087	67 41 12	3083
28	SUN	W.	104 8 24	3398	105 30 43	3390	106 53 12	3389	108 15 49	3373
	ALDEBARAN	W.	74 36 49	3031	76 6 23	3025	77 36 5	3017	79 5 57	3008
	POLLUX	W.	30 33 23	3067	32 2 13	3056	33 31 16	3046	35 0 32	3035
	SPICA	E.	60 17 47	3059	58 48 48	3053	57 19 41	3047	55 50 28	3041
29	SUN	W.	115 11 31	3324	116 35 14	3313	117 59 10	3302	119 23 19	3290
	ALDEBARAN	W.	86 37 54	2963	88 8 53	2953	89 40 5	2942	91 11 30	2939
	POLLUX	W.	42 30 15	2980	44 0 53	2968	45 31 46	2956	47 2 54	2943
	SPICA	E.	48 22 17	3006	46 52 12	2999	45 21 58	2991	43 51 34	2984
	ANTARES	E.	94 12 9	2977	92 41 28	2967	91 10 33	2957	89 39 25	2946
30	ALDEBARAN	W.	98 52 9	2872	100 25 3	2860	101 58 13	2847	103 31 39	2834
	POLLUX	W.	54 42 29	2880	56 15 13	2866	57 48 15	2853	59 21 34	2840
	SPICA	E.	36 17 17	2949	34 46 0	2944	33 14 37	2938	31 43 7	2934
	ANTARES	E.	82 0 11	2886	80 27 35	2873	78 54 43	2859	77 21 35	2847
	MARS	E.	86 15 41	2833	84 41 56	2820	83 7 55	2807	81 33 36	2793

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Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Pollux E.	48 19 22	2800	46 44 54	2814	45 10 44	2828	43 36 52	2842
	SATURN E.	83 4 47	2778	81 29 51	2791	79 55 10	2804	78 20 47	2817
	Regulus E.	84 16 51	2787	82 42 7	2800	81 7 40	2813	79 33 30	2826
22	SUN W.	43 45 30	2855	45 10 34	2867	46 35 24	2877	48 0 2	2888
	Pollux E.	35 52 8	2912	34 20 5	2926	32 48 22	2942	31 16 57	2956
	SATURN E.	70 32 56	2877	69 0 8	2889	67 27 36	2900	65 55 18	2911
	Regulus E.	71 46 42	2888	70 14 8	2900	68 41 48	2911	67 9 43	2922
23	SUN W.	55 0 5	3339	56 23 31	3348	57 46 45	3357	59 9 50	3366
	SATURN E.	58 17 17	2964	56 46 20	2973	55 15 34	2982	53 45 1	2991
	Regulus E.	59 32 48	2976	58 2 5	2985	56 31 33	2994	55 1 13	3003
	Spica E.	113 33 17	2993	112 2 56	3002	110 32 46	3010	109 2 47	3018
24	SUN W.	66 2 49	3405	67 25 0	3411	68 47 4	3417	70 9 1	3423
	Aldebaran W.	33 11 55	3058	34 40 57	3062	36 9 55	3065	37 38 48	3068
	SATURN E.	46 14 51	3032	44 45 18	3039	43 15 52	3045	41 46 35	3051
	Regulus E.	47 32 18	3045	46 3 1	3052	44 33 52	3058	43 4 53	3065
	Spica E.	101 35 9	3054	100 6 3	3060	98 37 4	3065	97 8 11	3070
25	SUN W.	76 57 23	3443	78 18 51	3445	79 40 16	3447	81 1 38	3449
	Aldebaran W.	45 2 16	3081	46 30 49	3083	47 59 20	3085	49 27 49	3088
	SATURN E.	34 21 56	3077	32 53 18	3082	31 24 45	3086	29 56 17	3090
	Regulus E.	35 41 51	3085	34 13 36	3101	32 45 27	3107	31 17 25	3112
	Spica E.	89 45 14	3090	88 16 52	3093	86 48 33	3095	85 20 16	3097
26	SUN W.	87 48 15	3451	89 9 36	3449	90 30 58	3447	91 52 23	3444
	Aldebaran W.	56 50 11	3089	58 18 43	3090	59 47 16	3078	61 15 52	3075
	SATURN E.	22 35 1	3106	21 6 59	3110	19 39 2	3116	18 11 12	3123
	Regulus E.	23 58 52	3141	22 31 35	3151	21 4 28	3162	19 37 34	3176
	Spica E.	77 59 16	3098	76 31 4	3097	75 2 51	3096	73 34 36	3095
27	SUN W.	98 40 21	3493	100 2 11	3416	101 24 9	3412	102 46 12	3405
	Aldebaran W.	68 39 52	3055	70 8 56	3050	71 38 6	3044	73 7 24	3038
	Spica E.	66 12 41	3079	64 44 6	3075	63 15 25	3070	61 46 39	3065
28	SUN W.	109 38 36	3364	111 1 33	3355	112 24 41	3345	113 48 0	3335
	Aldebaran W.	80 35 59	3000	82 6 11	2992	83 36 34	2983	85 7 8	2973
	Pollux W.	36 30 1	3094	37 59 44	3012	39 29 41	3008	40 59 51	2991
	Spica E.	54 21 7	3034	52 51 37	3028	51 21 59	3021	49 52 12	3014
29	SUN W.	120 47 42	3279	122 12 18	3266	123 37 9	3253	125 2 15	3240
	Aldebaran W.	92 43 8	2990	94 15 1	2998	95 47 9	2987	97 19 31	2985
	Pollux W.	48 34 18	2923	50 5 56	2919	51 37 51	2906	53 10 2	2893
	Spica E.	42 21 1	2976	40 50 19	2968	39 19 27	2961	37 48 26	2955
	Antares E.	88 8 4	2934	86 36 28	2923	85 4 37	2911	83 32 32	2899
30	Aldebaran W.	105 5 23	2821	106 39 23	2807	108 13 41	2794	109 48 17	2781
	Pollux W.	60 55 10	2825	62 29 5	2812	64 3 17	2797	65 37 49	2784
	Spica E.	30 11 31	2933	28 39 55	2923	27 8 17	2921	25 36 39	2930
	Antares E.	75 48 10	2835	74 14 28	2821	72 40 28	2809	71 6 12	2795
	MARS E.	79 58 59	2778	78 24 3	2766	76 48 51	2732	75 13 20	2737

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Thur.	1	^h 2 ^m 34 ^s 25.58	9.542	N. 15° 8' 52.0	+45.21	15' 54.21	66.08	^m 3 ^s 1.63	^s 0.313
Frid.	2	2 38 14.87	9.565	15 26 49.6	44.58	15 53.98	66.16	3 8.87	0.290
Sat.	3	2 42 4.70	9.588	15 44 31.8	43.94	15 53.75	66.24	3 15.58	0.267
SUN.	4	2 45 55.08	9.611	16 1 58.3	+43.28	15 53.52	66.32	3 21.74	0.244
Mon.	5	2 49 46.02	9.634	16 19 9.0	42.61	15 53.29	66.40	3 27.33	0.221
Tues.	6	2 53 37.53	9.658	16 36 3.4	41.93	15 53.07	66.48	3 32.36	0.197
Wed.	7	2 57 29.61	9.683	16 52 41.4	+41.23	15 52.84	66.56	3 36.83	0.173
Thur.	8	3 1 22.27	9.707	17 9 2.6	40.53	15 52.62	66.64	3 40.72	0.149
Frid.	9	3 5 15.53	9.731	17 25 6.8	39.81	15 52.40	66.72	3 44.00	0.125
Sat.	10	3 9 9.38	9.756	17 40 53.7	+39.08	15 52.18	66.80	3 46.70	0.100
SUN.	11	3 13 3.82	9.781	17 56 22.9	38.34	15 51.96	66.88	3 48.81	0.075
Mon.	12	3 16 58.85	9.806	18 11 34.3	37.59	15 51.75	66.97	3 50.33	0.050
Tues.	13	3 20 54.48	9.831	18 26 27.4	+36.83	15 51.54	67.05	3 51.26	0.025
Wed.	14	3 24 50.70	9.855	18 41 2.0	36.05	15 51.33	67.13	3 51.59	0.001
Thur.	15	3 28 47.52	9.880	18 55 17.8	35.26	15 51.13	67.21	3 51.32	0.024
Frid.	16	3 32 44.92	9.904	19 9 14.6	+34.46	15 50.93	67.29	3 50.48	0.048
Sat.	17	3 36 42.90	9.928	19 22 52.1	33.64	15 50.74	67.37	3 49.07	0.072
SUN.	18	3 40 41.44	9.951	19 36 9.8	32.82	15 50.55	67.45	3 47.09	0.095
Mon.	19	3 44 40.54	9.974	19 49 7.6	+31.99	15 50.36	67.53	3 44.55	0.118
Tues.	20	3 48 40.19	9.996	20 1 45.2	31.14	15 50.18	67.61	3 41.46	0.140
Wed.	21	3 52 40.38	10.018	20 14 2.2	30.27	15 50.00	67.69	3 37.84	0.162
Thur.	22	3 56 41.10	10.041	20 25 58.5	+29.40	15 49.83	67.76	3 33.69	0.184
Frid.	23	4 0 42.33	10.062	20 37 33.8	28.52	15 49.66	67.84	3 29.03	0.205
Sat.	24	4 4 44.07	10.083	20 48 47.8	27.63	15 49.50	67.91	3 23.86	0.226
SUN.	25	4 8 46.30	10.103	20 59 40.3	+26.73	15 49.34	67.98	3 18.20	0.246
Mon.	26	4 12 49.01	10.123	21 10 11.1	25.82	15 49.18	68.05	3 12.07	0.266
Tues.	27	4 16 52.19	10.142	21 20 19.9	24.90	15 49.03	68.12	3 5.47	0.285
Wed.	28	4 20 55.82	10.161	21 30 6.6	+23.97	15 48.89	68.18	2 58.41	0.304
Thur.	29	4 24 59.89	10.179	21 39 30.9	23.03	15 48.75	68.25	2 50.92	0.322
Frid.	30	4 29 4.39	10.196	21 48 32.6	22.09	15 48.61	68.31	2 43.00	0.339
Sat.	31	4 33 9.30	10.213	21 57 11.5	21.14	15 48.47	68.37	2 34.67	0.356
SUN.	32	4 37 14.62	10.230	N. 22° 5' 27.6	+20.19	15 48.34	68.43	2 25.93	0.373

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Thur.	1	^h 2 ^m 34 ^s 26.06	9.543	N. 15° 8' 54.2"	+45.21	^m 3 ^s 1.65	0.313	^h 2 ^m 37 ^s 27.70
Frid.	2	2 38 15.37	9.566	15 26 51.8	44.58	3 8.89	0.290	2 41 24.26
Sat.	3	2 42 5.22	9.589	15 44 34.1	43.94	3 15.59	0.267	2 45 20.81
SUN.	4	2 45 55.62	9.612	16 2 0.7	+43.28	3 21.75	0.244	2 49 17.37
Mon.	5	2 49 46.58	9.635	16 19 11.4	42.61	3 27.34	0.221	2 53 13.92
Tues.	6	2 53 38.11	9.659	16 36 5.9	41.93	3 32.37	0.197	2 57 10.48
Wed.	7	2 57 30.20	9.683	16 52 43.9	+41.23	3 36.84	0.173	3 1 7.04
Thur.	8	3 1 22.87	9.707	17 9 5.2	40.53	3 40.73	0.149	3 5 3.60
Frid.	9	3 5 16.14	9.731	17 25 9.4	39.81	3 44.01	0.125	3 9 0.15
Sat.	10	3 9 10.00	9.756	17 40 56.2	+39.08	3 46.71	0.100	3 12 56.71
SUN.	11	3 13 4.44	9.781	17 56 25.4	38.34	3 48.82	0.075	3 16 53.26
Mon.	12	3 16 59.48	9.806	18 11 36.7	37.59	3 50.34	0.050	3 20 49.82
Tues.	13	3 20 55.12	9.831	18 26 29.8	+36.83	3 51.26	0.025	3 24 46.37
Wed.	14	3 24 51.34	9.855	18 41 4.3	36.05	3 51.59	0.001	3 28 42.93
Thur.	15	3 28 48.16	9.880	18 55 20.1	35.26	3 51.32	0.024	3 32 39.48
Frid.	16	3 32 45.56	9.904	19 9 16.8	+34.46	3 50.48	0.048	3 36 36.04
Sat.	17	3 36 43.53	9.928	19 22 54.2	33.64	3 49.07	0.072	3 40 32.60
SUN.	18	3 40 42.07	9.951	19 36 11.9	32.82	3 47.09	0.095	3 44 29.16
Mon.	19	3 44 41.17	9.974	19 49 9.6	+31.99	3 44.55	0.118	3 48 25.71
Tues.	20	3 48 40.81	9.996	20 1 47.1	31.14	3 41.46	0.140	3 52 22.27
Wed.	21	3 52 40.99	10.018	20 14 4.1	30.27	3 37.83	0.162	3 56 18.82
Thur.	22	3 56 41.70	10.040	20 26 0.3	+29.40	3 33.68	0.184	4 0 15.38
Frid.	23	4 0 42.92	10.061	20 37 35.5	28.52	3 29.02	0.205	4 4 11.94
Sat.	24	4 4 44.65	10.082	20 48 49.4	27.63	3 23.85	0.226	4 8 8.50
SUN.	25	4 8 46.86	10.102	20 59 41.8	+26.73	3 18.19	0.246	4 12 5.05
Mon.	26	4 12 49.55	10.122	21 10 12.5	25.82	3 12.06	0.266	4 16 1.61
Tues.	27	4 16 52.70	10.141	21 20 21.2	24.90	3 5.46	0.285	4 19 58.16
Wed.	28	4 20 56.32	10.160	21 30 7.8	+23.97	2 58.40	0.304	4 23 54.72
Thur.	29	4 25 0.37	10.178	21 39 32.0	23.03	2 50.91	0.322	4 27 51.28
Frid.	30	4 29 4.85	10.195	21 48 33.6	22.09	2 42.99	0.339	4 31 47.84
Sat.	31	4 33 9.74	10.212	21 57 12.4	21.14	2 34.66	0.356	4 35 44.40
SUN.	32	4 37 15.04	10.229	N. 22° 5' 28.4"	+20.19	2 25.92	0.373	4 39 40.96

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour
+9°.8565.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	121	41° 2' 37.1	2' 39.0	145.39	+ 0.76	0.0035306	+44.1	21 ^h 19 ^m 2.18 ^s
2	122	42 0 45.5	0 47.3	145.31	0.72	0.0036361	43.8	21 15 6.27
3	123	42 58 52.1	58 53.7	145.24	0.66	0.0037410	43.6	21 11 10.36
4	124	43 56 56.9	56 58.4	145.17	+ 0.57	0.0038454	+43.4	21 7 14.45
5	125	44 55 0.1	55 1.4	145.10	0.46	0.0039493	43.2	21 3 18.54
6	126	45 53 1.7	53 2.9	145.04	0.33	0.0040526	42.9	20 59 22.63
7	127	46 51 1.8	51 2.8	144.98	+ 0.20	0.0041552	+42.6	20 55 26.72
8	128	47 49 0.4	49 1.3	144.92	+ 0.07	0.0042570	42.3	20 51 30.81
9	129	48 46 57.7	46 58.4	144.86	— 0.06	0.0043579	41.9	20 47 34.90
10	130	49 44 53.7	44 54.3	144.81	— 0.18	0.0044578	+41.4	20 43 38.99
11	131	50 42 48.4	42 48.9	144.76	0.27	0.0045566	40.9	20 39 43.08
12	132	51 40 41.9	40 42.2	144.71	0.34	0.0046541	40.3	20 35 47.17
13	133	52 38 34.1	38 34.3	144.66	— 0.38	0.0047501	+39.7	20 31 51.26
14	134	53 36 25.1	36 25.1	144.60	0.39	0.0048445	39.0	20 27 55.35
15	135	54 34 14.9	34 14.7	144.55	0.37	0.0049371	38.2	20 23 59.44
16	136	55 32 3.5	32 3.2	144.50	— 0.33	0.0050278	+37.4	20 20 3.53
17	137	56 29 50.9	29 50.5	144.45	0.25	0.0051165	36.5	20 16 7.62
18	138	57 27 37.0	27 36.4	144.39	0.16	0.0052031	35.6	20 12 11.71
19	139	58 25 21.7	25 20.9	144.33	— 0.05	0.0052875	+34.7	20 8 15.80
20	140	59 23 5.0	23 4.0	144.27	+ 0.08	0.0053699	33.9	20 4 19.89
21	141	60 20 46.9	20 45.8	144.22	0.21	0.0054501	33.0	20 0 23.98
22	142	61 18 27.4	18 26.2	144.17	+ 0.34	0.0055281	+32.2	19 56 28.07
23	143	62 16 6.5	16 5.1	144.11	0.46	0.0056041	31.3	19 52 32.15
24	144	63 13 44.1	13 42.5	144.04	0.57	0.0056782	30.5	19 48 36.24
25	145	64 11 20.2	11 18.4	143.98	+ 0.65	0.0057503	+29.7	19 44 40.33
26	146	65 8 54.9	8 53.0	143.92	0.70	0.0058205	28.9	19 40 44.42
27	147	66 6 28.3	6 26.3	143.86	0.73	0.0058890	28.2	19 36 48.51
28	148	67 4 0.3	3 58.1	143.80	+ 0.73	0.0059560	+27.6	19 32 52.60
29	149	68 1 30.8	1 28.4	143.74	0.70	0.0060215	27.0	19 28 56.69
30	150	68 59 0.0	58 57.4	143.69	0.64	0.0060856	26.4	19 25 0.78
31	151	69 56 28.1	56 25.3	143.64	0.55	0.0061484	25.9	19 21 4.86
32	152	70 53 55.1	53 52.1	143.60	+ 0.44	0.0062099	+25.4	19 17 8.96
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0.								
Diff. for 1 Hour, — 9 ^m .8296. (Table II.)								

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	
							^h ^m	^m	
1	15 18.0	15 23.6	56 2.4	+1.68	56 23.1	+1.75	9 45.6	1.85	12.2
2	15 29.4	15 35.3	56 44.4	1.78	57 5.9	1.78	10 30.4	1.91	13.2
3	15 41.1	15 46.7	57 27.2	1.75	57 48.0	1.69	11 17.2	2.01	14.2
4	15 52.1	15 57.1	58 7.8	+1.59	58 26.2	+1.46	12 6.7	2.14	15.2
5	16 1.7	16 5.7	58 42.9	1.31	58 57.6	1.13	12 59.9	2.29	16.2
6	16 9.1	16 11.9	59 10.1	0.95	59 20.3	0.75	13 56.8	2.44	17.2
7	16 14.0	16 15.4	59 28.0	+0.54	59 33.3	+0.34	14 56.9	2.54	18.2
8	16 16.2	16 16.4	59 36.2	+0.15	59 36.9	-0.03	15 58.5	2.55	19.2
9	16 16.0	16 15.1	59 35.5	-0.20	59 32.2	0.35	16 59.5	2.49	20.2
10	16 13.8	16 12.0	59 27.2	-0.48	59 20.8	-0.59	17 58.0	2.36	21.2
11	16 9.9	16 7.5	59 13.1	0.69	59 4.3	0.77	18 53.0	2.22	22.2
12	16 4.9	16 2.0	58 54.6	0.84	58 44.1	0.91	19 44.7	2.10	23.2
13	15 58.9	15 55.7	58 32.8	-0.97	58 20.9	-1.02	20 33.6	2.00	24.2
14	15 52.3	15 48.7	58 8.4	1.07	57 55.3	1.11	21 20.8	1.95	25.2
15	15 45.0	15 41.2	57 41.7	1.15	57 27.6	1.19	22 7.3	1.94	26.2
16	15 37.2	15 33.2	57 13.1	-1.23	56 58.2	-1.26	22 54.0	1.96	27.2
17	15 29.0	15 24.8	56 42.9	1.28	56 27.5	1.29	23 41.6	2.01	28.2
18	15 20.6	15 16.4	56 12.0	1.29	55 56.6	1.27	6		29.2
19	15 12.3	15 8.3	55 41.5	-1.24	55 26.8	-1.20	0 30.5	2.06	0.7
20	15 4.5	15 0.9	55 12.8	1.13	54 59.7	1.05	1 20.5	2.10	1.7
21	14 57.7	14 54.7	54 47.7	0.95	54 37.0	0.83	2 11.4	2.12	2.7
22	14 52.2	14 50.2	54 27.8	-0.69	54 20.3	-0.54	3 2.1	2.10	3.7
23	14 48.7	14 47.7	54 14.8	-0.38	54 11.3	-0.20	3 52.0	2.05	4.7
24	14 47.4	14 47.7	54 10.1	0.00	54 11.2	+0.20	4 40.3	1.97	5.7
25	14 48.7	14 50.4	54 14.8	+0.40	54 20.9	+0.61	5 26.8	1.90	6.7
26	14 52.7	14 55.7	54 29.5	0.83	54 40.7	1.04	6 11.5	1.84	7.7
27	14 59.3	15 3.6	54 54.4	1.24	55 10.5	1.43	6 55.1	1.81	8.7
28	15 8.6	15 14.2	55 28.8	+1.61	55 49.2	+1.78	7 38.2	1.81	9.7
29	15 20.3	15 26.9	56 11.5	1.92	56 35.2	2.02	8 21.8	1.85	10.7
30	15 33.7	15 40.6	57 0.0	2.10	57 25.5	2.14	9 6.9	1.93	11.7
31	15 47.6	15 54.5	57 51.2	2.13	58 16.6	2.08	9 54.7	2.06	12.7
32	16 1.2	16 7.5	58 41.1	+1.98	59 4.1	+1.84	10 46.3	2.24	13.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	^h 12 ^m 5 ^s 36.52	1.9489	N. 4 59' 7.7"	12.898	0	^h 13 ^m 40 ^s 56.38	2.0532	S. 5 44' 17.4"	13.596
1	12 7 33.12	1.9437	4 46 12.7	12.933	1	13 42 59.68	2.0570	5 57 48.6	13.512
2	12 9 29.77	1.9447	4 33 15.7	12.967	2	13 45 3.22	2.0610	6 11 18.9	13.497
3	12 11 26.48	1.9457	4 20 16.7	13.000	3	13 47 7.00	2.0650	6 24 48.3	13.482
4	12 13 23.25	1.9467	4 7 15.7	13.033	4	13 49 11.02	2.0690	6 38 16.7	13.465
5	12 15 20.08	1.9477	3 54 12.7	13.066	5	13 51 15.28	2.0730	6 51 44.1	13.447
6	12 17 16.98	1.9489	3 41 7.8	13.097	6	13 53 19.78	2.0771	7 5 10.3	13.427
7	12 19 13.95	1.9502	3 28 1.1	13.127	7	13 55 24.53	2.0813	7 18 35.3	13.406
8	12 21 11.00	1.9514	3 14 52.6	13.156	8	13 57 29.54	2.0856	7 31 59.0	13.383
9	12 23 8.12	1.9527	3 1 42.4	13.184	9	13 59 34.80	2.0899	7 45 21.3	13.359
10	12 25 5.32	1.9541	2 48 30.5	13.212	10	14 1 40.32	2.0942	7 58 42.1	13.334
11	12 27 2.61	1.9556	2 35 17.0	13.238	11	14 3 46.11	2.0987	8 12 1.4	13.308
12	12 28 59.99	1.9571	2 22 2.0	13.264	12	14 5 52.17	2.1032	8 25 19.1	13.281
13	12 30 57.46	1.9586	2 8 45.4	13.289	13	14 7 58.50	2.1077	8 38 35.1	13.252
14	12 32 55.03	1.9602	1 55 27.3	13.312	14	14 10 5.10	2.1123	8 51 49.3	13.221
15	12 34 52.69	1.9619	1 42 7.9	13.335	15	14 12 11.98	2.1170	9 5 1.6	13.189
16	12 36 50.46	1.9637	1 28 47.1	13.357	16	14 14 19.14	2.1217	9 18 12.0	13.157
17	12 38 48.34	1.9656	1 15 25.0	13.379	17	14 16 26.58	2.1264	9 31 20.4	13.123
18	12 40 46.33	1.9675	1 2 1.6	13.400	18	14 18 34.31	2.1313	9 44 26.7	13.087
19	12 42 44.44	1.9694	0 48 37.0	13.419	19	14 20 42.33	2.1362	9 57 30.8	13.049
20	12 44 42.66	1.9713	0 35 11.3	13.436	20	14 22 50.65	2.1411	10 10 32.6	13.010
21	12 46 41.00	1.9734	0 21 44.6	13.453	21	14 24 59.26	2.1460	10 23 32.0	12.970
22	12 48 39.47	1.9756	N. 0 8 16.9	13.470	22	14 27 8.17	2.1511	10 36 29.0	12.928
23	12 50 38.07	1.9778	S. 0 5 11.8	13.487	23	14 29 17.39	2.1562	S. 10 49 23.4	12.885
FRIDAY 2.					SUNDAY 4.				
0	12 52 36.80	1.9800	S. 0 18 41.5	13.502	0	14 31 26.91	2.1613	S. 11 2 15.2	12.841
1	12 54 35.67	1.9823	0 32 12.0	13.514	1	14 33 36.74	2.1664	11 15 4.3	12.795
2	12 56 34.68	1.9847	0 45 43.2	13.526	2	14 35 46.88	2.1716	11 27 50.6	12.747
3	12 58 33.84	1.9879	0 59 15.1	13.537	3	14 37 57.34	2.1769	11 40 34.0	12.698
4	13 0 33.15	1.9897	1 12 47.7	13.548	4	14 40 8.11	2.1822	11 53 14.4	12.648
5	13 2 32.61	1.9922	1 26 20.9	13.557	5	14 42 19.20	2.1876	12 5 51.7	12.596
6	13 4 32.22	1.9948	1 39 54.6	13.566	6	14 44 30.62	2.1930	12 18 25.9	12.543
7	13 6 31.99	1.9976	1 53 28.8	13.573	7	14 46 42.36	2.1984	12 30 56.8	12.487
8	13 8 31.93	2.0004	2 7 3.4	13.579	8	14 48 54.43	2.2039	12 43 24.4	12.431
9	13 10 32.04	2.0033	2 20 38.3	13.584	9	14 51 6.83	2.2094	12 55 48.5	12.373
10	13 12 32.32	2.0062	2 34 13.5	13.588	10	14 53 19.56	2.2150	13 8 9.1	12.313
11	13 14 32.78	2.0091	2 47 48.9	13.591	11	14 55 32.63	2.2206	13 20 26.1	12.252
12	13 16 33.41	2.0120	3 1 24.4	13.592	12	14 57 46.03	2.2262	13 32 39.4	12.190
13	13 18 34.22	2.0151	3 15 0.0	13.593	13	14 59 59.77	2.2319	13 44 48.9	12.126
14	13 20 35.22	2.0183	3 28 35.6	13.593	14	15 2 13.85	2.2376	13 56 54.5	12.060
15	13 22 36.42	2.0216	3 42 11.2	13.592	15	15 4 28.28	2.2433	14 8 56.1	11.992
16	13 24 37.81	2.0249	3 55 46.7	13.590	16	15 6 43.05	2.2491	14 20 53.6	11.923
17	13 26 39.40	2.0282	4 9 22.0	13.586	17	15 8 58.17	2.2549	14 32 46.9	11.853
18	13 28 41.19	2.0315	4 22 57.0	13.580	18	15 11 13.64	2.2607	14 44 35.9	11.781
19	13 30 43.18	2.0349	4 36 31.6	13.574	19	15 13 29.46	2.2666	14 56 20.6	11.707
20	13 32 45.38	2.0385	4 50 5.8	13.567	20	15 15 45.63	2.2724	15 8 0.8	11.632
21	13 34 47.80	2.0422	5 3 39.6	13.559	21	15 18 2.15	2.2783	15 19 36.4	11.555
22	13 36 50.44	2.0458	5 17 12.9	13.549	22	15 20 19.03	2.2842	15 31 7.4	11.477
23	13 38 53.30	2.0495	5 30 45.5	13.538	23	15 22 36.26	2.2902	15 42 33.6	11.397
24	13 40 56.38	2.0532	S. 5 44 17.4	13.526	24	15 24 53.85	2.2962	S. 15 53 55.0	11.315

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
0	15 24 53.85	2.3992	S. 15° 53' 55.0"	11.315	0	17 21 48.70	2.5607	S. 22° 53' 6.9"	5.584
1	15 27 11.80	2.3992	16 5 11.4	11.232	1	17 24 22.46	2.5647	22 58 37.4	5.439
2	15 29 30.11	2.3981	16 16 22.8	11.147	2	17 26 56.47	2.5687	23 3 58.7	5.978
3	15 31 48.77	2.3140	16 27 29.1	11.061	3	17 29 30.71	2.5796	23 9 10.7	5.193
4	15 34 7.79	2.3901	16 38 30.1	10.979	4	17 32 5.18	2.5783	23 14 13.4	4.967
5	15 36 27.18	2.3892	16 49 25.8	10.883	5	17 34 39.87	2.5800	23 19 6.7	4.810
6	15 38 46.93	2.3922	17 0 16.1	10.792	6	17 37 14.78	2.5836	23 23 50.6	4.652
7	15 41 7.04	2.3882	17 11 0.9	10.699	7	17 39 49.90	2.5870	23 28 25.0	4.493
8	15 43 27.51	2.3442	17 21 40.0	10.604	8	17 42 25.22	2.5902	23 32 49.8	4.334
9	15 45 48.34	2.3502	17 32 13.4	10.508	9	17 45 0.73	2.5934	23 37 5.1	4.174
10	15 48 9.53	2.3562	17 42 41.0	10.411	10	17 47 36.43	2.5965	23 41 10.7	4.013
11	15 50 31.09	2.3623	17 53 2.7	10.311	11	17 50 12.31	2.5995	23 45 6.6	3.851
12	15 52 53.01	2.3683	18 3 18.3	10.209	12	17 52 48.37	2.6023	23 48 52.8	3.688
13	15 55 15.29	2.3743	18 13 27.8	10.107	13	17 55 24.59	2.6050	23 52 29.2	3.524
14	15 57 37.93	2.3803	18 23 31.2	10.004	14	17 58 0.97	2.6077	23 55 55.7	3.360
15	16 0 0.93	2.3863	18 33 28.3	9.898	15	18 0 37.51	2.6102	23 59 12.4	3.196
16	16 2 24.29	2.3923	18 43 19.0	9.791	16	18 3 14.19	2.6124	24 2 19.2	3.030
17	16 4 48.01	2.3982	18 53 3.2	9.682	17	18 5 51.00	2.6146	24 5 16.0	2.864
18	16 7 12.08	2.4042	19 2 40.8	9.572	18	18 8 27.94	2.6167	24 8 2.9	2.698
19	16 9 36.51	2.4102	19 12 11.8	9.460	19	18 11 5.00	2.6187	24 10 39.8	2.531
20	16 12 1.30	2.4161	19 21 36.0	9.346	20	18 13 42.18	2.6205	24 13 6.6	2.363
21	16 14 26.44	2.4219	19 30 53.3	9.231	21	18 16 19.46	2.6222	24 15 23.3	2.194
22	16 16 51.93	2.4277	19 40 3.7	9.114	22	18 18 56.84	2.6237	24 17 29.9	2.026
23	16 19 17.77	2.4335	S. 19 49 7.0	8.996	23	18 21 34.30	2.6250	S. 24 19 26.4	1.857
TUESDAY 6.					THURSDAY 8.				
0	16 21 43.95	2.4393	S. 19 58 3.2	8.877	0	18 24 11.84	2.6263	S. 24 21 12.8	1.688
1	16 24 10.48	2.4450	20 6 52.2	8.756	1	18 26 49.46	2.6275	24 22 49.0	1.516
2	16 26 37.35	2.4507	20 15 33.9	8.632	2	18 29 27.14	2.6284	24 24 15.0	1.349
3	16 29 4.56	2.4563	20 24 8.1	8.507	3	18 32 4.87	2.6292	24 25 30.9	1.180
4	16 31 32.11	2.4620	20 32 34.8	8.382	4	18 34 42.65	2.6300	24 26 36.6	1.009
5	16 34 0.00	2.4676	20 40 54.0	8.256	5	18 37 20.47	2.6306	24 27 32.0	0.838
6	16 36 28.22	2.4731	20 49 5.5	8.127	6	18 39 58.32	2.6310	24 28 17.1	0.667
7	16 38 56.77	2.4785	20 57 9.2	7.997	7	18 42 36.19	2.6312	24 28 52.0	0.497
8	16 41 25.64	2.4839	21 5 5.1	7.866	8	18 45 14.07	2.6314	24 29 16.7	0.327
9	16 43 54.84	2.4893	21 12 53.1	7.733	9	18 47 51.96	2.6314	24 29 31.2	- 0.156
10	16 46 24.36	2.4946	21 20 33.1	7.599	10	18 50 29.84	2.6313	24 29 35.4	+ 0.016
11	16 48 54.19	2.4998	21 28 5.0	7.463	11	18 53 7.72	2.6312	24 29 29.3	0.167
12	16 51 24.33	2.5049	21 35 28.7	7.326	12	18 55 45.58	2.6308	24 29 13.0	0.357
13	16 53 54.78	2.5100	21 42 44.1	7.187	13	18 58 23.41	2.6302	24 28 46.5	0.597
14	16 56 25.53	2.5150	21 49 51.2	7.048	14	19 1 1.20	2.6295	24 28 9.7	0.698
15	16 58 56.58	2.5200	21 56 49.9	6.907	15	19 3 38.95	2.6287	24 27 22.7	0.864
16	17 1 27.93	2.5249	22 3 40.1	6.765	16	19 6 16.64	2.6277	24 26 25.5	1.038
17	17 3 59.57	2.5297	22 10 21.7	6.622	17	19 8 54.27	2.6266	24 25 18.1	1.208
18	17 6 31.49	2.5343	22 16 54.7	6.478	18	19 11 31.83	2.6253	24 24 0.5	1.378
19	17 9 3.69	2.5389	22 23 19.0	6.332	19	19 14 9.31	2.6240	24 22 32.7	1.547
20	17 11 36.16	2.5434	22 29 34.5	6.184	20	19 16 46.71	2.6225	24 20 54.8	1.716
21	17 14 8.90	2.5479	22 35 41.1	6.035	21	19 19 24.01	2.6208	24 19 6.8	1.884
22	17 16 41.91	2.5522	22 41 38.7	5.885	22	19 22 1.21	2.6191	24 17 8.7	2.052
23	17 19 15.18	2.5566	22 47 27.3	5.735	23	19 24 38.30	2.6173	24 15 0.5	2.220
24	17 21 48.70	2.5607	S. 22 53 6.9	5.584	24	19 27 15.28	2.6153	S. 21 12 42.3	2.387

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9.					SUNDAY 11.				
0	19 27 15.28	2.6153	S. 24° 12' 42.3	2.387	0	21 28 30.77	2.4099	S. 19° 21' 20.6	2.399
1	19 29 52.13	2.6131	24 10 14.1	2.553	1	21 30 55.16	2.4037	19 11 57.4	2.443
2	19 32 28.85	2.6108	24 7 35.9	2.790	2	21 33 19.22	2.3989	19 2 27.4	2.557
3	19 35 5.43	2.6084	24 4 47.7	2.886	3	21 35 42.94	2.3936	18 52 50.6	2.668
4	19 37 41.86	2.6058	24 1 49.6	3.051	4	21 38 6.33	2.3871	18 43 7.1	2.779
5	19 40 18.13	2.6032	23 58 41.6	3.215	5	21 40 29.39	2.3815	18 33 17.1	2.887
6	19 42 54.24	2.6004	23 55 23.8	3.378	6	21 42 52.11	2.3759	18 23 20.7	2.994
7	19 45 30.18	2.5978	23 51 56.2	3.541	7	21 45 14.50	2.3703	18 13 17.9	10.100
8	19 48 5.95	2.5947	23 48 18.9	3.703	8	21 47 36.55	2.3647	18 3 8.7	10.205
9	19 50 41.54	2.5916	23 44 31.8	3.865	9	21 49 58.27	2.3592	17 52 53.3	10.308
10	19 53 16.94	2.5884	23 40 35.1	4.025	10	21 52 19.66	2.3537	17 42 31.8	10.409
11	19 55 52.14	2.5851	23 36 28.8	4.185	11	21 54 40.72	2.3482	17 32 4.2	10.509
12	19 58 27.15	2.5817	23 32 12.9	4.344	12	21 57 1.44	2.3426	17 21 30.7	10.607
13	20 1 1.95	2.5789	23 27 47.5	4.502	13	21 59 21.83	2.3371	17 10 51.3	10.705
14	20 3 36.53	2.5745	23 23 12.6	4.660	14	22 1 41.89	2.3317	17 0 6.1	10.800
15	20 6 10.89	2.5707	23 18 28.3	4.816	15	22 4 1.63	2.3262	16 49 15.3	10.894
16	20 8 45.02	2.5669	23 13 34.7	4.971	16	22 6 21.04	2.3207	16 38 18.9	10.987
17	20 11 18.92	2.5631	23 8 31.8	5.125	17	22 8 40.12	2.3152	16 27 16.9	11.078
18	20 13 52.59	2.5591	23 3 19.7	5.278	18	22 10 58.87	2.3098	16 16 9.5	11.168
19	20 16 26.01	2.5549	22 57 58.4	5.431	19	22 13 17.30	2.3045	16 4 56.8	11.266
20	20 18 59.18	2.5507	22 52 28.0	5.582	20	22 15 35.41	2.2991	15 53 38.8	11.343
21	20 21 32.10	2.5465	22 46 48.5	5.733	21	22 17 53.19	2.2938	15 42 15.6	11.429
22	20 24 4.76	2.5422	22 41 0.0	5.882	22	22 20 10.66	2.2885	15 30 47.4	11.519
23	20 26 37.16	2.5378	S. 22° 35' 2.6	6.030	23	22 22 27.81	2.2832	S. 15° 19' 14.2	11.596
SATURDAY 10.					MONDAY 12.				
0	20 29 9.29	2.5339	S. 22° 28' 56.4	6.177	0	22 24 44.65	2.2780	S. 15° 7' 36.0	11.677
1	20 31 41.14	2.5298	22 22 41.4	6.323	1	22 27 1.17	2.2728	14 55 53.0	11.756
2	20 34 12.72	2.5240	22 16 17.7	6.468	2	22 29 17.38	2.2676	14 44 5.3	11.833
3	20 36 44.02	2.5192	22 9 45.3	6.612	3	22 31 33.28	2.2625	14 32 13.0	11.910
4	20 39 15.03	2.5144	22 3 4.3	6.754	4	22 33 48.88	2.2575	14 20 16.1	11.986
5	20 41 45.75	2.5096	21 56 14.8	6.895	5	22 36 4.18	2.2525	14 8 14.7	12.059
6	20 44 16.19	2.5048	21 49 16.9	7.035	6	22 38 19.18	2.2475	13 56 9.0	12.131
7	20 46 46.33	2.4998	21 42 10.6	7.173	7	22 40 33.88	2.2425	13 43 59.0	12.203
8	20 49 16.17	2.4948	21 34 56.1	7.310	8	22 42 48.28	2.2375	13 31 44.7	12.273
9	20 51 45.71	2.4897	21 27 33.4	7.447	9	22 45 2.38	2.2326	13 19 26.2	12.342
10	20 54 14.94	2.4846	21 20 2.5	7.583	10	22 47 16.19	2.2276	13 7 3.7	12.408
11	20 56 43.86	2.4794	21 12 23.5	7.716	11	22 49 29.72	2.2221	12 54 37.3	12.473
12	20 59 12.47	2.4742	21 4 36.6	7.847	12	22 51 42.96	2.2164	12 42 7.0	12.537
13	21 1 40.77	2.4690	20 56 41.8	7.978	13	22 53 55.92	2.2107	12 29 32.9	12.599
14	21 4 8.75	2.4637	20 48 39.2	8.108	14	22 56 8.60	2.2051	12 16 55.1	12.660
15	21 6 36.42	2.4584	20 40 28.8	8.237	15	22 58 21.01	2.2005	12 4 13.7	12.720
16	21 9 3.76	2.4530	20 32 10.7	8.364	16	23 0 33.14	2.1999	11 51 28.7	12.778
17	21 11 30.78	2.4476	20 23 45.1	8.489	17	23 2 45.00	2.1955	11 38 40.3	12.835
18	21 13 57.48	2.4422	20 15 12.0	8.613	18	23 4 56.60	2.1911	11 25 48.5	12.891
19	21 16 23.85	2.4367	20 6 31.5	8.737	19	23 7 7.94	2.1867	11 12 53.4	12.945
20	21 18 49.89	2.4313	19 57 43.6	8.858	20	23 9 19.01	2.1823	10 59 55.1	12.998
21	21 21 15.61	2.4259	19 48 48.5	8.978	21	23 11 29.82	2.1781	10 46 53.7	13.049
22	21 23 41.00	2.4203	19 39 46.2	9.097	22	23 13 40.38	2.1740	10 33 49.2	13.099
23	21 26 6.05	2.4147	19 30 36.9	9.213	23	23 15 50.70	2.1699	10 20 41.8	13.147
24	21 28 30.77	2.4092	S. 19° 21' 20.6	9.329	24	23 18 0.77	2.1658	S. 10° 7' 31.5	13.195

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
0	23 18 0.77	2.1658	N. 10° 7' 31.5	13.195	0	0 58 28.67	2.0453	N. 0° 55' 51.6	13.979
1	23 20 10.59	2.1618	9 54 18.4	13.241	1	1 0 31.36	2.0444	1 9 49.6	13.950
2	23 22 20.18	2.1578	9 41 2.6	13.286	2	1 2 34.00	2.0436	1 23 46.7	13.944
3	23 24 29.53	2.1539	9 27 44.1	13.330	3	1 4 36.59	2.0428	1 37 42.9	13.939
4	23 26 38.65	2.1501	9 14 23.0	13.373	4	1 6 39.14	2.0421	1 51 38.2	13.913
5	23 28 47.54	2.1463	9 0 59.5	13.419	5	1 8 41.65	2.0414	2 5 32.5	13.895
6	23 30 56.21	2.1426	8 47 33.6	13.451	6	1 10 44.11	2.0406	2 19 25.6	13.876
7	23 33 4.66	2.1390	8 34 5.4	13.489	7	1 12 46.54	2.0403	2 33 17.6	13.857
8	23 35 12.89	2.1353	8 20 34.9	13.526	8	1 14 48.94	2.0398	2 47 8.4	13.836
9	23 37 20.90	2.1317	8 7 2.3	13.561	9	1 16 51.32	2.0394	3 0 57.9	13.814
10	23 39 28.70	2.1283	7 53 27.6	13.595	10	1 18 53.67	2.0390	3 14 46.1	13.791
11	23 41 36.30	2.1250	7 39 50.9	13.628	11	1 20 56.00	2.0387	3 28 32.8	13.766
12	23 43 43.70	2.1217	7 26 12.2	13.660	12	1 22 58.32	2.0385	3 42 18.0	13.741
13	23 45 50.90	2.1184	7 12 31.7	13.690	13	1 25 0.62	2.0383	3 56 1.7	13.715
14	23 47 57.91	2.1153	6 58 49.4	13.719	14	1 27 2.91	2.0380	4 9 43.8	13.687
15	23 50 4.73	2.1121	6 45 5.4	13.747	15	1 29 5.20	2.0381	4 23 24.1	13.658
16	23 52 11.36	2.1089	6 31 19.8	13.773	16	1 31 7.48	2.0381	4 37 2.7	13.628
17	23 54 17.80	2.1058	6 17 32.7	13.798	17	1 33 9.77	2.0380	4 50 39.5	13.597
18	23 56 24.06	2.1029	6 3 44.1	13.822	18	1 35 12.06	2.0380	5 4 14.4	13.565
19	23 58 30.15	2.1001	5 49 54.1	13.844	19	1 37 14.35	2.0383	5 17 47.3	13.539
20	0 0 36.07	2.0973	5 36 2.8	13.866	20	1 39 16.66	2.0386	5 31 18.2	13.498
21	0 2 41.83	2.0946	5 22 10.2	13.886	21	1 41 18.98	2.0389	5 44 47.1	13.464
22	0 4 47.42	2.0919	5 8 16.5	13.904	22	1 43 21.32	2.0390	5 58 13.9	13.428
23	0 6 52.85	2.0892	S. 4 54 21.7	13.923	23	1 45 23.68	2.0395	N. 6 11 38.5	13.391
WEDNESDAY 14.					FRIDAY 16.				
0	0 8 58.13	2.0867	S. 4 40 25.8	13.940	0	1 47 26.06	2.0390	N. 6 25 0.8	13.359
1	0 11 3.26	2.0849	4 26 28.9	13.955	1	1 49 28.47	2.0404	6 38 20.8	13.313
2	0 13 8.24	2.0818	4 12 31.2	13.967	2	1 51 30.91	2.0409	6 51 38.4	13.279
3	0 15 13.08	2.0785	3 58 32.8	13.979	3	1 53 33.38	2.0415	7 4 53.5	13.231
4	0 17 17.78	2.0772	3 44 33.7	13.991	4	1 55 35.89	2.0421	7 18 6.1	13.189
5	0 19 22.34	2.0749	3 30 33.9	14.003	5	1 57 38.44	2.0428	7 31 16.2	13.146
6	0 21 26.77	2.0728	3 16 33.5	14.011	6	1 59 41.03	2.0436	7 44 23.6	13.101
7	0 23 31.08	2.0707	3 2 32.6	14.019	7	2 1 43.67	2.0443	7 57 28.3	13.056
8	0 25 35.26	2.0687	2 48 31.2	14.026	8	2 3 46.35	2.0451	8 10 30.3	13.009
9	0 27 39.32	2.0667	2 34 29.5	14.031	9	2 5 49.08	2.0460	8 23 29.4	12.961
10	0 29 43.27	2.0649	2 20 27.5	14.035	10	2 7 51.87	2.0469	8 36 25.6	12.919
11	0 31 47.11	2.0631	2 6 25.3	14.038	11	2 9 54.71	2.0478	8 49 18.9	12.883
12	0 33 50.84	2.0614	1 52 22.9	14.040	12	2 11 57.61	2.0489	9 2 9.2	12.812
13	0 35 54.47	2.0597	1 38 20.5	14.040	13	2 14 0.58	2.0500	9 14 56.4	12.761
14	0 37 58.00	2.0580	1 24 18.1	14.040	14	2 16 3.61	2.0510	9 27 40.5	12.708
15	0 40 1.43	2.0564	1 10 15.7	14.039	15	2 18 6.70	2.0521	9 40 21.4	12.655
16	0 42 4.72	2.0549	0 56 13.4	14.037	16	2 20 9.86	2.0533	9 52 59.1	12.600
17	0 44 8.07	2.0535	0 42 11.3	14.033	17	2 22 13.10	2.0546	10 5 33.4	12.544
18	0 46 11.19	2.0522	0 28 9.5	14.027	18	2 24 16.41	2.0558	10 18 4.4	12.488
19	0 48 14.28	2.0509	0 14 8.1	14.020	19	2 26 19.80	2.0571	10 30 32.0	12.430
20	0 50 17.30	2.0496	S. 0 0 7.1	14.013	20	2 28 23.27	2.0585	10 42 56.0	12.371
21	0 52 20.24	2.0484	N. 0 13 53.5	14.005	21	2 30 26.82	2.0596	10 55 16.5	12.319
22	0 54 23.11	2.0473	0 27 53.5	13.995	22	2 32 30.45	2.0619	11 7 33.4	12.251
23	0 56 25.12	2.0463	0 41 52.9	13.984	23	2 34 34.17	2.0637	11 19 46.6	12.189
24	0 58 28.67	2.0453	N. 0 55 51.6	13.979	24	2 36 37.98	2.0649	N. 11 31 56.1	12.127

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	2 36 37.98	2.0642	N.11° 31' 56.1"	12.127	0	4 17 52.20	2.1580	N.19° 44' 42.1"	8.084
1	2 38 41.88	2.0657	11 44 1.8	12.063	1	4 20 1.74	2.1600	19 52 44.1	7.981
2	2 40 45.87	2.0672	11 56 3.7	11.999	2	4 22 11.40	2.1619	20 0 39.9	7.877
3	2 42 49.95	2.0688	12 8 1.7	11.933	3	4 24 21.17	2.1638	20 8 29.4	7.773
4	2 44 54.13	2.0705	12 19 55.7	11.867	4	4 26 31.06	2.1658	20 16 12.6	7.667
5	2 46 58.41	2.0722	12 31 45.7	11.800	5	4 28 41.06	2.1677	20 23 49.5	7.563
6	2 49 2.79	2.0738	12 43 31.7	11.733	6	4 30 51.18	2.1696	20 31 20.0	7.455
7	2 51 7.27	2.0755	12 55 13.5	11.666	7	4 33 1.41	2.1714	20 38 44.1	7.348
8	2 53 11.85	2.0773	13 6 51.1	11.599	8	4 35 11.75	2.1733	20 46 1.8	7.241
9	2 55 16.54	2.0791	13 18 24.5	11.531	9	4 37 22.20	2.1751	20 53 13.0	7.133
10	2 57 21.34	2.0808	13 29 53.6	11.464	10	4 39 32.76	2.1768	21 0 17.7	7.024
11	2 59 26.24	2.0826	13 41 18.3	11.396	11	4 41 43.42	2.1785	21 7 15.9	6.915
12	3 1 31.25	2.0844	13 52 38.7	11.329	12	4 43 54.18	2.1803	21 14 7.5	6.805
13	3 3 36.37	2.0863	14 3 54.6	11.267	13	4 46 5.05	2.1820	21 20 52.5	6.695
14	3 5 41.61	2.0882	14 15 5.9	11.151	14	4 48 16.02	2.1836	21 27 30.9	6.584
15	3 7 46.96	2.0901	14 26 12.7	11.075	15	4 50 27.08	2.1852	21 34 2.6	6.473
16	3 9 52.42	2.0920	14 37 14.9	10.997	16	4 52 38.24	2.1868	21 40 27.6	6.361
17	3 11 58.00	2.0940	14 48 12.4	10.919	17	4 54 49.49	2.1884	21 46 45.9	6.249
18	3 14 3.70	2.0960	14 59 5.2	10.840	18	4 57 0.84	2.1899	21 52 57.5	6.137
19	3 16 9.52	2.0980	15 9 53.2	10.760	19	4 59 12.28	2.1913	21 59 2.3	6.023
20	3 18 15.46	2.1000	15 20 36.4	10.679	20	5 1 23.80	2.1928	22 5 0.3	5.909
21	3 20 21.52	2.1020	15 31 14.7	10.597	21	5 3 35.41	2.1943	22 10 51.4	5.795
22	3 22 27.70	2.1040	15 41 48.1	10.514	22	5 5 47.11	2.1957	22 16 35.7	5.681
23	3 24 34.00	2.1060	N.15 52 16.4	10.430	23	5 7 58.89	2.1969	N.22 22 13.1	5.566
SUNDAY 18.					TUESDAY 20.				
0	3 26 40.42	2.1081	N.16 2 39.7	10.346	0	5 10 10.74	2.1982	N.22 27 43.6	5.451
1	3 28 46.97	2.1102	16 12 57.9	10.261	1	5 12 22.67	2.1994	22 33 7.2	5.335
2	3 30 53.64	2.1122	16 23 11.0	10.175	2	5 14 34.67	2.2006	22 38 23.8	5.219
3	3 33 0.44	2.1143	16 33 18.9	10.088	3	5 16 46.74	2.2017	22 43 33.4	5.103
4	3 35 7.36	2.1164	16 43 21.6	10.001	4	5 18 58.88	2.2029	22 48 36.1	4.986
5	3 37 14.41	2.1185	16 53 19.0	9.913	5	5 21 11.09	2.2040	22 53 31.7	4.868
6	3 39 21.58	2.1206	17 3 11.0	9.822	6	5 23 23.36	2.2050	22 58 20.3	4.751
7	3 41 28.88	2.1227	17 12 57.6	9.733	7	5 25 35.69	2.2060	23 3 1.8	4.634
8	3 43 36.30	2.1248	17 22 38.8	9.642	8	5 27 48.08	2.2069	23 7 36.3	4.516
9	3 45 43.85	2.1269	17 32 14.6	9.551	9	5 30 0.52	2.2078	23 12 3.7	4.397
10	3 47 51.53	2.1291	17 41 44.9	9.457	10	5 32 13.01	2.2086	23 16 24.0	4.278
11	3 49 59.34	2.1312	17 51 9.5	9.363	11	5 34 25.55	2.2093	23 20 37.1	4.159
12	3 52 7.27	2.1333	18 0 28.5	9.269	12	5 36 38.13	2.2101	23 24 43.1	4.041
13	3 54 15.33	2.1354	18 9 41.8	9.174	13	5 38 50.76	2.2108	23 28 42.0	3.922
14	3 56 23.52	2.1375	18 18 49.4	9.079	14	5 41 3.43	2.2114	23 32 33.7	3.803
15	3 58 31.83	2.1396	18 27 51.3	8.983	15	5 43 16.13	2.2119	23 36 18.2	3.684
16	4 0 40.27	2.1417	18 36 47.4	8.886	16	5 45 28.86	2.2124	23 39 55.5	3.565
17	4 2 48.83	2.1437	18 45 37.6	8.788	17	5 47 41.62	2.2129	23 43 25.6	3.446
18	4 4 57.51	2.1457	18 54 21.9	8.689	18	5 49 54.41	2.2133	23 46 48.5	3.328
19	4 7 6.32	2.1478	19 3 0.3	8.591	19	5 52 7.22	2.2137	23 50 4.2	3.201
20	4 9 15.25	2.1498	19 11 32.8	8.492	20	5 54 20.05	2.2140	23 53 12.6	3.080
21	4 11 24.30	2.1519	19 19 59.3	8.391	21	5 56 32.90	2.2142	23 56 13.8	2.959
22	4 13 33.48	2.1540	19 28 19.7	8.289	22	5 58 45.76	2.2144	23 59 7.7	2.838
23	4 15 42.78	2.1560	19 36 34.0	8.187	23	6 0 58.63	2.2146	24 1 54.4	2.718
24	4 17 52.20	2.1580	N.19 44 42.1	8.084	24	6 3 11.51	2.2147	N.24 4 33.9	2.597

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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WEDNESDAY 21.

h	m	s	°	'	"	h	m	s	°	'	"
0	6	3	11.51	2.2147	N.24	4	33.9	2.597			
1	6	5	24.39	2.2147	24	7	6.1	2.476			
2	6	7	37.27	2.2147	24	9	31.0	2.354			
3	6	9	50.15	2.2146	24	11	48.6	2.233			
4	6	12	3.02	2.2144	24	13	58.9	2.112			
5	6	14	15.88	2.2142	24	16	2.0	1.991			
6	6	16	28.72	2.2139	24	17	57.8	1.869			
7	6	18	41.55	2.2136	24	19	46.3	1.748			
8	6	20	54.36	2.2133	24	21	27.5	1.627			
9	6	23	7.14	2.2128	24	23	1.5	1.506			
10	6	25	19.89	2.2123	24	24	28.2	1.384			
11	6	27	32.61	2.2118	24	25	47.6	1.263			
12	6	29	45.30	2.2112	24	26	59.7	1.142			
13	6	31	57.95	2.2105	24	28	4.6	1.021			
14	6	34	10.56	2.2097	24	29	2.2	0.899			
15	6	36	23.12	2.2090	24	29	52.5	0.778			
16	6	38	35.64	2.2082	24	30	35.6	0.658			
17	6	40	48.10	2.2073	24	31	11.5	0.537			
18	6	43	0.51	2.2063	24	31	40.1	0.417			
19	6	45	12.86	2.2053	24	32	1.5	0.297			
20	6	47	25.15	2.2043	24	32	15.7	0.176			
21	6	49	37.37	2.2032	24	32	22.6	+ 0.056			
22	6	51	49.53	2.2020	24	32	22.4	- 0.063			
23	6	54	1.61	2.2007	N.24	32	15.0	0.183			

THURSDAY 22.

h	m	s	°	'	"	h	m	s	°	'	"
0	6	56	13.62	2.1995	N.24	32	0.4	0.309			
1	6	58	25.55	2.1989	24	31	38.7	0.422			
2	7	0	37.40	2.1982	24	31	9.8	0.541			
3	7	2	49.17	2.1964	24	30	33.8	0.660			
4	7	5	0.85	2.1939	24	29	50.6	0.778			
5	7	7	12.44	2.1923	24	29	0.4	0.896			
6	7	9	23.93	2.1906	24	28	3.1	1.014			
7	7	11	35.33	2.1889	24	26	58.7	1.132			
8	7	13	46.63	2.1874	24	25	47.3	1.249			
9	7	15	57.82	2.1857	24	24	28.9	1.366			
10	7	18	8.91	2.1839	24	23	3.4	1.483			
11	7	20	19.89	2.1821	24	21	30.9	1.599			
12	7	22	30.76	2.1802	24	19	51.5	1.715			
13	7	24	41.52	2.1783	24	18	5.1	1.831			
14	7	26	52.16	2.1763	24	16	11.8	1.947			
15	7	29	2.68	2.1743	24	14	11.5	2.062			
16	7	31	13.08	2.1723	24	12	4.3	2.177			
17	7	33	23.35	2.1709	24	9	50.3	2.291			
18	7	35	33.50	2.1691	24	7	29.4	2.405			
19	7	37	43.52	2.1659	24	5	1.7	2.518			
20	7	39	53.41	2.1636	24	2	27.2	2.631			
21	7	42	3.16	2.1613	23	59	45.9	2.744			
22	7	44	12.77	2.1591	23	56	57.9	2.857			
23	7	46	22.26	2.1568	23	54	3.1	2.969			
24	7	48	31.59	2.1544	N.23	51	1.6	3.081			

FRIDAY 23.

h	m	s	°	'	"	h	m	s	°	'	"
0	7	48	31.59	2.1544	N.23	51	1.6	3.081			
1	7	50	40.78	2.1520	23	47	53.4	3.192			
2	7	52	49.83	2.1496	23	44	38.6	3.302			
3	7	54	58.73	2.1471	23	41	17.2	3.412			
4	7	57	7.48	2.1446	23	37	49.2	3.522			
5	7	59	16.08	2.1421	23	34	14.6	3.631			
6	8	1	24.53	2.1395	23	30	33.5	3.740			
7	8	3	32.82	2.1369	23	26	45.8	3.848			
8	8	5	40.96	2.1343	23	22	51.7	3.956			
9	8	7	48.94	2.1317	23	18	51.1	4.063			
10	8	9	56.76	2.1290	23	14	44.1	4.170			
11	8	12	4.42	2.1263	23	10	30.7	4.276			
12	8	14	11.92	2.1236	23	6	11.0	4.382			
13	8	16	19.25	2.1208	23	1	44.9	4.487			
14	8	18	26.42	2.1181	22	57	12.5	4.592			
15	8	20	33.42	2.1153	22	52	33.9	4.696			
16	8	22	40.25	2.1124	22	47	49.0	4.800			
17	8	24	46.91	2.1096	22	42	57.9	4.903			
18	8	26	53.41	2.1068	22	38	0.6	5.006			
19	8	28	59.73	2.1039	22	32	57.2	5.108			
20	8	31	5.88	2.1011	22	27	47.7	5.209			
21	8	33	11.86	2.0982	22	22	32.1	5.311			
22	8	35	17.67	2.0953	22	17	10.4	5.412			
23	8	37	23.30	2.0924	N.22	11	42.6	5.512			

SATURDAY 24.

h	m	s	°	'	"	h	m	s	°	'	"
0	8	39	28.76	2.0895	N.22	6	8.9	5.611			
1	8	41	34.04	2.0866	22	0	29.3	5.709			
2	8	43	39.15	2.0837	21	54	43.8	5.806			
3	8	45	44.08	2.0807	21	48	52.4	5.902			
4	8	47	48.83	2.0777	21	42	55.1	6.003			
5	8	49	53.41	2.0748	21	36	52.0	6.100			
6	8	51	57.81	2.0718	21	30	43.1	6.196			
7	8	54	2.03	2.0688	21	24	28.5	6.291			
8	8	56	6.07	2.0659	21	18	8.2	6.386			
9	8	58	9.94	2.0630	21	11	42.2	6.481			
10	9	0	13.63	2.0600	21	5	10.5	6.574			
11	9	2	17.14	2.0571	20	58	33.3	6.667			
12	9	4	20.48	2.0542	20	51	50.5	6.760			
13	9	6	23.64	2.0512	20	45	2.1	6.852			
14	9	8	26.62	2.0482	20	38	8.2	6.943			
15	9	10	29.43	2.0453	20	31	8.9	7.033			
16	9	12	32.06	2.0423	20	24	4.2	7.123			
17	9	14	34.51	2.0394	20	16	54.1	7.213			
18	9	16	36.79	2.0365	20	9	38.6	7.302			
19	9	18	38.90	2.0337	20	2	17.8	7.391			
20	9	20	40.83	2.0308	19	54	51.7	7.479			
21	9	22	42.50	2.0279	19	47	20.3	7.567			
22	9	24	44.18	2.0250	19	39	43.7	7.653			
23	9	26	45.59	2.0221	19	32	2.0	7.738			
24	9	28	46.83	2.0192	N.19	24	15.1	7.824			

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	^h 9 ^m 28 ^s 46.83	2.0192	N. 19° 24' 15.1"	7.894	0	^h 11 ^m 2 ^s 56.55	1.9180	N. 11° 41' 33.8"	11.225
1	9 30 47.90	2.0184	19 16 23.1	7.909	1	11 4 51.60	1.9170	11 30 18.6	11.261
2	9 32 48.80	2.0137	19 8 26.0	7.923	2	11 6 46.59	1.9159	11 19 0.1	11.336
3	9 34 49.54	2.0109	19 0 23.9	8.077	3	11 8 41.51	1.9149	11 7 38.3	11.391
4	9 36 50.11	2.0083	18 52 16.8	8.180	4	11 10 36.38	1.9140	10 56 13.2	11.446
5	9 38 50.52	2.0054	18 44 4.7	8.243	5	11 12 31.19	1.9131	10 44 44.8	11.500
6	9 40 50.76	2.0027	18 35 47.6	8.326	6	11 14 25.95	1.9123	10 33 13.2	11.553
7	9 42 50.84	2.0000	18 27 25.6	8.407	7	11 16 20.66	1.9115	10 21 38.5	11.605
8	9 44 50.76	1.9973	18 18 58.8	8.487	8	11 18 15.33	1.9108	10 10 0.6	11.657
9	9 46 50.52	1.9947	18 10 27.2	8.567	9	11 20 9.90	1.9102	9 58 19.6	11.708
10	9 48 50.12	1.9920	18 1 50.8	8.646	10	11 22 4.55	1.9096	9 46 35.6	11.758
11	9 50 49.56	1.9893	17 53 9.7	8.724	11	11 23 59.11	1.9090	9 34 48.6	11.809
12	9 52 48.84	1.9867	17 44 23.9	8.803	12	11 25 53.63	1.9085	9 22 58.5	11.859
12	9 54 47.97	1.9842	17 35 33.4	8.881	13	11 27 48.13	1.9081	9 11 5.5	11.907
14	9 56 46.95	1.9817	17 26 38.2	8.958	14	11 29 42.61	1.9077	8 59 9.6	11.955
15	9 58 45.78	1.9792	17 17 38.4	9.035	15	11 31 37.06	1.9074	8 47 10.9	12.002
16	10 0 44.46	1.9767	17 8 34.0	9.111	16	11 33 31.50	1.9072	8 35 9.3	12.049
17	10 2 42.99	1.9743	16 59 25.1	9.186	17	11 35 25.92	1.9068	8 23 5.0	12.095
18	10 4 41.38	1.9720	16 50 11.7	9.261	18	11 37 20.33	1.9068	8 10 57.9	12.141
19	10 6 39.63	1.9696	16 40 53.8	9.335	19	11 39 14.74	1.9068	7 58 48.1	12.186
20	10 8 37.73	1.9673	16 31 31.5	9.408	20	11 41 9.15	1.9068	7 46 35.6	12.231
21	10 10 35.69	1.9649	16 22 4.8	9.481	21	11 43 3.55	1.9068	7 34 20.4	12.274
22	10 12 33.52	1.9627	16 12 33.8	9.554	22	11 44 57.96	1.9069	7 22 2.7	12.317
23	10 14 31.21	1.9604	N. 16° 2' 58.4"	9.626	23	11 46 52.38	1.9071	N. 7° 9' 42.4"	12.359
MONDAY 26.					WEDNESDAY 28.				
0	10 16 28.77	1.9589	N. 15° 53' 18.7"	9.697	0	11 48 46.81	1.9073	N. 6° 57' 19.6"	12.401
1	10 18 26.20	1.9561	15 43 34.8	9.767	1	11 50 41.25	1.9076	6 44 54.3	12.442
2	10 20 23.50	1.9540	15 33 46.7	9.837	2	11 52 35.72	1.9080	6 32 26.6	12.482
3	10 22 20.68	1.9519	15 23 54.4	9.907	3	11 54 30.21	1.9084	6 19 56.5	12.522
4	10 24 17.73	1.9498	15 13 57.9	9.976	4	11 56 24.73	1.9089	6 7 24.0	12.561
5	10 26 14.65	1.9477	15 3 57.3	10.044	5	11 58 19.28	1.9094	5 54 49.2	12.599
6	10 28 11.45	1.9458	14 53 52.7	10.111	6	12 0 13.86	1.9100	5 42 12.1	12.637
7	10 30 8.14	1.9439	14 43 44.0	10.178	7	12 2 8.48	1.9107	5 29 32.8	12.674
8	10 32 4.72	1.9420	14 33 31.3	10.244	8	12 4 3.14	1.9114	5 16 51.3	12.710
9	10 34 1.18	1.9401	14 23 14.7	10.310	9	12 5 57.85	1.9122	5 4 7.6	12.746
10	10 35 57.53	1.9383	14 12 54.1	10.375	10	12 7 52.61	1.9131	4 51 21.8	12.780
11	10 37 53.78	1.9366	14 2 29.7	10.439	11	12 9 47.42	1.9140	4 38 34.0	12.813
12	10 39 49.93	1.9350	13 52 1.4	10.503	12	12 11 42.29	1.9150	4 25 44.2	12.847
13	10 41 45.98	1.9333	13 41 29.3	10.567	13	12 13 37.22	1.9160	4 12 52.4	12.880
14	10 43 41.92	1.9315	13 30 53.4	10.630	14	12 15 32.21	1.9172	3 59 58.6	12.912
15	10 45 37.76	1.9299	13 20 13.7	10.692	15	12 17 27.28	1.9185	3 47 3.0	12.943
16	10 47 33.51	1.9285	13 9 30.3	10.754	16	12 19 22.43	1.9198	3 34 5.5	12.973
17	10 49 29.18	1.9271	12 58 43.2	10.815	17	12 21 17.66	1.9211	3 21 6.2	13.002
18	10 51 24.76	1.9256	12 47 52.5	10.875	18	12 23 12.97	1.9225	3 8 5.2	13.031
19	10 53 20.25	1.9242	12 36 58.2	10.935	19	12 25 8.36	1.9240	2 55 2.5	13.059
20	10 55 15.66	1.9229	12 26 0.3	10.994	20	12 27 3.85	1.9256	2 41 58.1	13.087
21	10 57 11.00	1.9216	12 14 58.9	11.053	21	12 28 59.43	1.9272	2 28 52.0	13.114
22	10 59 6.26	1.9203	12 3 54.0	11.111	22	12 30 55.11	1.9288	2 15 44.4	13.139
23	11 1 1.44	1.9191	11 52 45.6	11.168	23	12 32 50.89	1.9306	2 2 35.3	13.163
24	11 2 56.55	1.9180	N. 11° 41' 33.8"	11.225	24	12 34 46.78	1.9324	N. 1° 49' 24.8"	13.187

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 29.					SATURDAY 31.				
0	12 34 46.78	1.9324	N. 1° 49' 24.8"	13.187	0	14 10 59.34	2.1040	S. 8° 53' 57.0"	13.213
1	12 36 42.78	1.9343	1 36 12.8	13.211	1	14 13 5.74	2.1092	9 7 9.0	13.186
2	12 38 38.90	1.9369	1 22 59.4	13.224	2	14 15 12.45	2.1145	9 20 19.4	13.158
3	12 40 35.13	1.9399	1 9 44.7	13.256	3	14 17 19.48	2.1199	9 33 28.0	13.128
4	12 42 31.49	1.9404	0 56 28.7	13.277	4	14 19 26.84	2.1255	9 46 34.7	13.096
5	12 44 27.98	1.9496	0 43 11.5	13.296	5	14 21 34.54	2.1311	9 59 39.5	13.063
6	12 46 24.60	1.9448	0 29 53.2	13.315	6	14 23 42.57	2.1467	10 12 42.2	13.028
7	12 48 21.36	1.9471	0 16 33.7	13.324	7	14 25 50.94	2.1423	10 25 42.8	12.992
8	12 50 18.26	1.9485	N. 0 3 13.1	13.359	8	14 27 59.65	2.1481	10 38 41.2	12.954
9	12 52 15.30	1.9519	S. 0 10 8.5	13.368	9	14 30 8.71	2.1539	10 51 37.3	12.916
10	12 54 12.49	1.9545	0 23 31.0	13.383	10	14 32 18.12	2.1596	11 4 31.1	12.876
11	12 56 9.84	1.9571	0 36 54.4	13.398	11	14 34 27.89	2.1657	11 17 22.4	12.833
12	12 58 7.34	1.9597	0 50 16.7	13.412	12	14 36 38.01	2.1717	11 30 11.1	12.790
13	13 0 5.00	1.9694	1 3 43.8	13.424	13	14 38 48.49	2.1778	11 42 57.2	12.745
14	13 2 2.83	1.9653	1 17 9.6	13.436	14	14 40 59.34	2.1839	11 55 40.5	12.698
15	13 4 0.84	1.9689	1 30 36.1	13.447	15	14 43 10.56	2.1901	12 8 21.0	12.651
16	13 5 59.02	1.9712	1 44 3.3	13.458	16	14 45 22.15	2.1962	12 20 58.6	12.601
17	13 7 57.38	1.9749	1 57 31.1	13.468	17	14 47 34.11	2.2024	12 33 33.1	12.549
18	13 9 55.92	1.9773	2 10 59.5	13.477	18	14 49 46.44	2.2087	12 46 4.5	12.497
19	13 11 54.65	1.9805	2 24 28.3	13.483	19	14 51 59.15	2.2151	12 58 32.7	12.443
20	13 13 53.58	1.9837	2 37 57.4	13.489	20	14 54 12.25	2.2216	13 10 57.6	12.387
21	13 15 52.70	1.9870	2 51 26.0	13.494	21	14 56 25.74	2.2281	13 23 19.1	12.329
22	13 17 52.02	1.9904	3 4 56.7	13.498	22	14 58 39.62	2.2346	13 35 37.1	12.270
23	13 19 51.55	1.9939	S. 3 18 26.7	13.502	23	15 0 53.89	2.2411	S. 13 47 51.5	12.210
FRIDAY 30.					SUNDAY, JUNE 1.				
0	13 21 51.29	1.9975	S. 3 31 56.9	13.504	0	15 3 8.55	2.2477	S. 14 0 2.3	12.146
1	13 23 51.25	2.0011	3 45 27.2	13.505	PHASES OF THE MOON.				
2	13 25 51.42	2.0047	3 58 57.5	13.506					
3	13 27 51.81	2.0084	4 12 27.8	13.504					
4	13 29 52.43	2.0123	4 25 58.0	13.509					
5	13 31 53.29	2.0162	4 39 28.0	13.499	☉ Full Moon . . . May 4 9 8.9				
6	13 33 54.38	2.0202	4 52 57.8	13.495					
7	13 35 55.71	2.0242	5 6 27.4	13.490					
8	13 37 57.29	2.0284	5 19 56.6	13.482					
9	13 39 59.12	2.0326	5 33 25.3	13.474	☾ Last Quarter . . . 11 4 21.6				
10	13 42 1.20	2.0368	5 46 53.5	13.466					
11	13 44 3.54	2.0412	6 0 21.2	13.457					
12	13 46 6.14	2.0456	6 13 48.3	13.448					
13	13 48 9.01	2.0501	6 27 14.7	13.433	● New Moon . . . 18 8 18.5				
14	13 50 12.15	2.0546	6 40 40.3	13.419					
15	13 52 15.56	2.0592	6 54 5.0	13.404					
16	13 54 19.25	2.0639	7 7 28.8	13.388					
17	13 56 23.23	2.0687	7 20 51.6	13.373	☾ First Quarter . . . 26 10 33.9				
18	13 58 27.49	2.0735	7 34 13.4	13.353					
19	14 0 32.05	2.0784	7 47 34.0	13.333					
20	14 2 36.90	2.0833	8 0 53.4	13.319	☾ Perigee . . . May 8 10.4				
21	14 4 42.05	2.0883	8 14 11.5	13.299					
22	14 6 47.50	2.0934	8 27 28.2	13.266					
23	14 8 53.26	2.0987	8 40 43.4	13.240					
24	14 10 59.34	2.1040	S. 8 53 57.0	13.213					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Aldebaran W.	111° 23' 10"	9766	112° 58' 22"	9759	114° 33' 52"	9739	116° 9' 40"	9795
	Pollux W.	67 12 38	9768	68 47 47	9754	70 23 15	9740	71 59 2	9795
	Regulus W.	31 17 56	9794	32 52 31	9778	34 27 28	9759	36 2 49	9743
	Antares E.	69 31 38	9792	67 56 47	9768	66 21 37	9755	64 46 10	9740
	Mars E.	73 37 30	9792	72 1 20	9708	70 24 51	9693	68 48 2	9679
2	Pollux W.	80 2 52	9651	81 40 38	9637	83 18 43	9629	84 57 7	9607
	Saturn W.	45 13 22	9651	46 51 7	9637	48 29 12	9622	50 7 37	9606
	Regulus W.	44 5 1	9661	45 42 32	9645	47 20 24	9630	48 58 38	9615
	Antares E.	56 44 22	9674	55 7 7	9660	53 29 34	9648	51 51 43	9635
	Mars E.	60 39 0	9693	59 0 11	9588	57 21 2	9574	55 41 32	9560
	α Aquilæ E.	103 5 58	3406	101 43 49	3384	100 21 14	3369	98 58 14	3340
3	Pollux W.	93 14 6	9537	94 54 26	9524	96 35 8	9510	98 16 8	9496
	Saturn W.	58 24 45	9535	60 5 10	9522	61 45 54	9509	63 26 56	9494
	Regulus W.	57 14 57	9540	58 55 14	9526	60 35 50	9512	62 16 47	9499
	Antares E.	43 38 20	9576	41 58 53	9566	40 19 12	9556	38 39 17	9547
	Mars E.	47 19 4	9488	45 37 34	9474	43 55 45	9460	42 13 37	9447
	α Aquilæ E.	91 57 26	3951	90 32 17	3938	89 6 53	3924	87 41 13	3913
	Jupiter E.	105 30 23	9559	103 50 32	9545	102 10 22	9531	100 29 52	9516
4	Pollux W.	106 45 37	9434	108 28 23	9423	110 11 25	9411	111 54 43	9400
	Saturn W.	71 56 48	9430	73 39 39	9419	75 22 48	9407	77 6 12	9395
	Regulus W.	70 46 10	9433	72 28 57	9421	74 12 0	9409	75 55 20	9398
	Mars E.	33 38 19	9385	31 54 22	9374	30 10 9	9363	28 25 40	9359
	α Aquilæ E.	80 29 59	3175	79 3 22	3173	77 36 41	3172	76 9 59	3173
	Jupiter E.	92 2 47	9453	90 20 28	9442	88 37 53	9430	86 55 1	9418
5	Saturn W.	85 47 7	9345	87 32 1	9336	89 17 8	9327	91 2 26	9319
	Regulus W.	84 35 57	9346	86 20 47	9336	88 5 51	9326	89 51 8	9321
	Spica W.	30 57 41	9442	32 40 16	9424	34 23 18	9407	36 6 43	9392
	α Aquilæ E.	68 57 23	3906	67 31 20	3918	66 5 33	3925	64 40 6	3954
	Jupiter E.	78 16 49	9368	76 32 27	9359	74 47 52	9350	73 3 5	9341
	Fomalhaut E.	99 43 57	9519	98 3 10	9508	96 22 8	9499	94 40 53	9489
6	Regulus W.	98 40 19	9286	100 26 39	9280	102 13 8	9274	103 59 44	9269
	Spica W.	44 48 50	9331	46 34 4	9321	48 19 32	9314	50 5 11	9306
	α Aquilæ E.	57 39 40	3402	56 17 26	3444	54 56 0	3493	53 35 28	3545
	Jupiter E.	64 16 20	9306	62 30 29	9300	60 44 30	9295	58 58 23	9290
	Fomalhaut E.	86 11 39	9454	84 29 20	9449	82 46 55	9445	81 4 24	9441
7	Spica W.	58 55 59	9277	60 42 32	9273	62 29 11	9269	64 15 55	9266
	Jupiter E.	50 6 16	9273	48 19 36	9271	46 32 53	9269	44 46 8	9268
	Fomalhaut E.	72 30 58	9436	70 48 16	9438	69 5 36	9441	67 23 0	9445
	α Pegasi E.	90 36 17	9651	88 58 32	9650	87 20 43	9648	85 42 54	9648
8	Spica W.	73 10 28	9259	74 57 29	9258	76 44 30	9259	78 31 31	9259
	Antares W.	27 28 13	9333	29 13 24	9323	30 58 50	9314	32 44 29	9307
	Jupiter E.	35 52 14	9271	34 5 31	9272	32 18 52	9274	30 32 17	9278
	Fomalhaut E.	58 51 43	9479	57 10 0	9489	55 28 32	9501	53 47 21	9514
	α Pegasi E.	77 34 16	9665	75 56 50	9673	74 19 34	9681	72 42 29	9691
	Sun E.	132 17 34	9541	130 37 18	9540	128 57 1	9540	127 16 45	9540

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W.	117° 45' 47"	9710	119° 22' 13"	9897	120° 58' 57"	9883	122° 36' 0"	9868
	Pollux W.	73 35 9	9710	75 11 35	9896	76 48 21	9880	78 25 27	9866
	Regulus W.	37 38 31	9795	39 14 36	9708	40 51 2	9892	42 27 51	9877
	Antares E.	63 10 24	9787	61 34 21	9713	59 57 59	9700	58 21 19	9687
	Mars E.	67 10 54	9863	65 33 26	9647	63 55 37	9632	62 17 29	9619
2	Pollux W.	86 35 52	9593	88 14 56	9579	89 54 20	9564	91 34 3	9550
	Saturn W.	51 46 23	9591	53 25 29	9576	55 4 54	9562	56 44 40	9549
	Regulus W.	50 37 12	9599	52 16 8	9584	53 55 24	9569	55 35 1	9555
	Antares E.	50 13 36	9683	48 35 11	9610	46 56 30	9596	45 17 33	9587
	Mars E.	54 1 42	9545	52 21 32	9531	50 41 3	9517	49 0 13	9503
	α Aquilæ E.	97 34 47	3319	96 10 58	3300	94 46 47	3283	93 22 17	3267
3	Pollux W.	99 57 26	9483	101 39 2	9470	103 20 57	9458	105 3 8	9446
	Saturn W.	65 8 18	9481	66 49 59	9468	68 31 57	9455	70 14 14	9443
	Regulus W.	63 58 2	9485	65 39 37	9472	67 21 30	9456	69 3 41	9446
	Antares E.	36 59 10	9540	35 18 53	9532	33 38 25	9527	31 57 50	9522
	Mars E.	40 31 10	9434	38 48 24	9421	37 5 20	9409	35 21 58	9397
	α Aquilæ E.	86 15 19	3299	84 49 13	3194	83 22 57	3187	81 56 32	3180
	Jupiter E.	98 49 4	9504	97 7 57	9491	95 26 31	9479	93 44 48	9466
4	Pollux W.	113 38 17	9380	115 22 5	9380	117 6 8	9370	118 50 25	9361
	Saturn W.	78 49 53	9384	80 33 49	9374	82 18 1	9364	84 2 27	9354
	Regulus W.	77 38 57	9387	79 22 50	9377	81 6 58	9366	82 51 20	9356
	Mars E.	26 40 56	9349	24 55 59	9339	23 10 47	9322	21 25 21	9313
	α Aquilæ E.	74 43 17	3175	73 16 38	3179	71 50 4	3186	70 23 38	3186
	Jupiter E.	85 11 53	9467	83 28 29	9397	81 44 50	9387	80 0 57	9378
5	Saturn W.	92 47 58	9311	94 33 41	9304	96 19 35	9297	98 5 39	9290
	Regulus W.	91 36 36	9313	93 22 16	9306	95 8 7	9299	96 54 8	9290
	Spica W.	37 50 32	9377	39 34 40	9363	41 19 7	9359	43 3 51	9341
	α Aquilæ E.	63 15 1	3275	61 50 21	3300	60 26 12	3330	59 2 37	3364
	Jupiter E.	71 18 6	9333	69 32 55	9396	67 47 33	9319	66 2 1	9312
	Fomalhaut E.	92 59 24	9480	91 17 43	9472	89 35 51	9465	87 53 49	9459
6	Regulus W.	105 46 28	9285	107 33 18	9281	109 20 14	9258	111 7 15	9255
	Spica W.	51 51 2	9299	53 37 3	9299	55 23 14	9287	57 9 33	9289
	α Aquilæ E.	52 15 54	3006	50 57 26	3673	49 40 10	3749	48 24 15	3832
	Jupiter E.	57 12 9	9386	55 25 48	9392	53 39 22	9279	51 52 51	9276
	Fomalhaut E.	79 21 48	9439	77 39 8	9437	75 56 26	9436	74 13 42	9435
7	Spica W.	66 2 44	9264	67 49 36	9282	69 36 31	9280	71 23 29	9259
	Jupiter E.	42 59 22	9267	41 12 34	9267	39 25 47	9268	37 38 59	9269
	Fomalhaut E.	65 40 29	9449	63 58 4	9454	62 15 47	9461	60 33 40	9469
	α Pegasi E.	84 5 4	9648	82 27 15	9651	80 49 30	9655	79 11 50	9659
8	Spica W.	80 18 31	9259	82 5 30	9280	83 52 28	9261	85 39 23	9263
	Antares W.	34 30 18	9292	36 16 16	9297	38 2 20	9293	39 48 30	9291
	Jupiter E.	28 45 46	9294	26 59 23	9290	25 13 9	9297	23 27 5	9294
	Fomalhaut E.	52 6 28	9530	50 25 57	9547	48 45 49	9566	47 6 8	9589
	α Pegasi E.	71 5 37	9708	69 29 0	9715	67 52 40	9729	66 16 39	9745
	Sun E.	125 36 28	9541	123 56 12	9549	122 15 58	9543	120 35 46	9545

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	Spica W.	87° 26' 16"	9265	89° 13' 5"	9267	90° 59' 50"	9270	92° 46' 32"	9274
	Antares W.	41 34 43	9289	43 20 59	9289	45 7 15	9288	46 53 32	9288
	Mars W.	38 13 37	2184	40 2 29	2184	41 51 20	2186	43 40 8	2189
	Fomalhaut E.	45 26 58	9614	43 48 22	9649	42 10 24	9673	40 33 8	9707
	α Pegasi E.	64 40 59	2769	63 5 42	2782	61 30 51	2804	59 56 28	2827
	Sun E.	118 55 36	9547	117 15 29	9549	115 35 26	9559	113 55 26	9555
10	Spica W.	101 38 45	9292	103 24 54	9297	105 10 56	9302	106 56 51	9308
	Antares W.	55 44 35	9297	57 30 39	9299	59 16 39	9302	61 2 35	9307
	Mars W.	52 43 7	2903	54 31 29	2907	56 19 46	2911	58 7 57	2915
	α Pegasi E.	52 13 17	9286	50 42 47	3029	49 13 11	3075	47 44 31	3127
	Sun E.	105 36 31	9573	103 57 0	9577	102 17 34	9589	100 38 15	9587
11	Antares W.	69 50 48	2396	71 36 8	2331	73 21 22	2336	75 6 28	2341
	Mars W.	67 7 22	2926	68 54 55	2941	70 42 21	2946	72 29 40	2951
	α Aquilæ W.	37 44 52	5374	38 38 18	5042	39 34 40	4839	40 33 44	4860
	Sun E.	92 23 18	9619	90 44 40	9617	89 6 9	9623	87 27 46	9629
12	Antares W.	83 50 7	2368	85 34 27	2374	87 18 38	2380	89 2 40	2386
	Mars W.	81 24 23	2977	83 10 56	2969	84 57 21	2987	86 43 38	2993
	α Aquilæ W.	46 2 27	4098	47 13 39	3939	48 26 19	3860	49 40 19	3789
	Jupiter W.	21 12 1	9414	22 55 16	9413	24 38 32	9414	26 21 45	9415
	Sun E.	79 17 52	9659	77 40 18	9665	76 2 52	9672	74 25 36	9679
13	Antares W.	97 40 39	2419	99 23 48	2426	101 6 46	2433	102 49 35	2440
	α Aquilæ W.	56 6 32	3530	57 26 23	3494	58 46 54	3460	60 8 2	3431
	Jupiter W.	34 57 1	9433	36 39 48	9438	38 22 30	9443	40 5 3	9448
	Sun E.	66 21 27	9713	64 45 4	9720	63 8 51	9727	61 32 48	9734
14	α Aquilæ W.	67 0 51	3296	68 24 30	3315	69 48 24	3303	71 12 32	3293
	Jupiter W.	48 35 52	2477	50 17 36	2484	51 59 12	2491	53 40 38	2498
	Sun E.	53 34 57	9772	51 59 53	9780	50 25 0	9788	48 50 16	9797
15	α Aquilæ W.	78 15 19	3270	79 40 5	3269	81 4 52	3271	82 29 37	3273
	Jupiter W.	62 5 24	2533	63 45 52	2540	65 26 9	2547	67 6 15	2554
	Sun E.	40 59 21	9838	39 25 44	9847	37 52 17	9856	36 19 3	9866
16	α Aquilæ W.	89 32 16	3303	90 56 24	3311	92 20 22	3322	93 44 8	3334
	Jupiter W.	75 24 6	2595	77 3 7	2603	78 41 56	2612	80 20 33	2621
	Sun E.	28 35 56	9916	27 3 58	9927	25 32 14	9938	24 0 44	9950
20	Sun W.	19 7 47	3980	20 32 45	3966	21 57 36	3974	23 22 19	3981
	Regulus E.	69 48 12	2693	68 15 44	2693	66 43 29	2613	65 11 25	2622
21	Sun W.	30 23 37	3390	31 47 25	3398	33 11 3	3336	34 34 33	3343
	Regulus E.	57 34 9	2968	56 3 17	2976	54 32 36	2985	53 2 6	2994
	Spica E.	111 35 27	9985	110 4 56	9992	108 34 34	3000	107 4 21	3007
22	Sun W.	41 29 51	3380	42 52 30	3386	44 15 2	3392	45 37 27	3398
	Saturn E.	44 43 14	3039	43 13 50	3046	41 44 35	3053	40 15 28	3060
	Regulus E.	45 32 13	3036	44 2 44	3044	42 33 25	3052	41 4 16	3059
	Spica E.	99 35 30	3041	98 6 9	3047	96 36 55	3053	95 7 48	3059

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Spica	W.	94° 33' 9"	2277	96° 19' 41"	2280	98° 6' 8"	2284	99° 52' 30"	2288
	Antares	W.	48 39 49	2289	50 26 4	2291	52 12 17	2293	53 58 28	2295
	Mars	W.	45 28 52	2191	47 17 32	2194	49 6 8	2197	50 54 39	2200
	Fomalhaut	E.	38 56 40	2749	37 21 5	2735	35 46 31	2848	34 13 6	2910
	α Pegasi	E.	58 22 36	2854	56 49 18	2882	55 16 36	2914	53 44 35	2948
	Sun	E.	112 15 29	2558	110 35 37	2561	108 55 50	2565	107 16 8	2569
10	Spica	W.	108 42 38	2313	110 28 18	2319	112 13 50	2325	113 59 14	2331
	Antares	W.	62 48 24	2310	64 34 9	2314	66 19 48	2318	68 5 21	2322
	Mars	W.	59 56 2	2219	61 44 2	2223	63 31 55	2227	65 19 41	2231
	α Pegasi	E.	46 16 54	3184	44 50 25	3249	43 25 12	3317	42 1 20	3396
	Sun	E.	98 59 2	2592	97 19 55	2597	95 40 56	2608	94 2 3	2607
11	Antares	W.	76 51 27	2346	78 36 19	2352	80 21 3	2357	82 5 39	2363
	Mars	W.	74 16 52	2256	76 3 56	2261	77 50 53	2267	79 37 42	2272
	α Aquilæ	W.	41 35 17	4503	42 39 6	4363	43 45 1	4337	44 52 52	4197
	Sun	E.	85 49 31	2635	84 11 24	2641	82 33 25	2647	80 55 34	2654
12	Antares	W.	90 46 34	2392	92 30 19	2398	94 13 55	2405	95 57 22	2412
	Mars	W.	88 29 47	2399	90 15 47	2305	92 1 39	2311	93 47 22	2317
	α Aquilæ	W.	50 55 32	3794	52 11 53	3867	53 29 12	3817	54 47 27	3873
	Jupiter	W.	28 4 56	2417	29 48 4	2420	31 31 9	2424	33 14 8	2429
	Sun	E.	72 48 28	2685	71 11 29	2691	69 34 39	2698	67 57 58	2706
13	Antares	W.	104 32 13	2447	106 14 42	2454	107 57 0	2461	109 39 8	2469
	α Aquilæ	W.	61 29 43	3406	62 51 53	3392	64 14 30	3392	65 37 30	3343
	Jupiter	W.	41 47 29	2452	43 29 47	2458	45 11 57	2465	46 53 59	2471
	Sun	E.	59 56 54	2741	58 21 10	2748	56 45 36	2756	55 10 12	2764
14	α Aquilæ	W.	72 36 51	3286	74 1 19	3280	75 25 53	3274	76 50 35	3272
	Jupiter	W.	55 21 54	2505	57 3 2	2512	58 43 59	2519	60 24 47	2526
	Sun	E.	47 15 44	2805	45 41 22	2813	44 7 10	2821	42 33 10	2830
15	α Aquilæ	W.	83 54 20	3277	85 18 58	3282	86 43 32	3287	88 7 58	3294
	Jupiter	W.	68 46 11	2561	70 25 57	2569	72 5 31	2578	73 44 54	2587
	Sun	E.	34 46 1	2876	33 13 10	2886	31 40 33	2895	30 8 8	2905
16	α Aquilæ	W.	95 7 40	3347	96 30 57	3360	97 53 59	3376	99 16 43	3394
	Jupiter	W.	81 59 0	2630	83 37 14	2639	85 15 17	2648	86 53 7	2657
	Sun	E.	22 29 29	2963	20 58 30	2976	19 27 47	2992	17 57 23	3008
20	Sun	W.	24 46 53	3288	26 11 18	3295	27 35 34	3304	28 59 40	3312
	Regulus	E.	63 39 34	2832	62 7 55	2841	60 36 28	2850	59 5 13	2859
21	Sun	W.	35 57 54	3351	37 21 5	3359	38 44 9	3368	40 7 4	3373
	Regulus	E.	51 31 46	3003	50 1 38	3012	48 31 39	3020	47 1 51	3028
	Spica	E.	105 34 17	3014	104 4 23	3021	102 34 37	3028	101 4 59	3035
22	Sun	W.	46 59 45	3403	48 21 57	3408	49 44 3	3414	51 6 4	3420
	Saturn	E.	38 46 30	3086	37 17 39	3073	35 48 57	3079	34 20 22	3086
	Regulus	E.	39 35 16	3067	38 6 24	3074	36 37 42	3081	35 9 8	3088
	Spica	E.	93 38 49	3054	92 9 55	3069	90 41 9	3074	89 12 29	3078

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III ^h .	P. L. of Diff.	VI ^h .	P. L. of Diff.	IX ^h .	P. L. of Diff.
23	SUN W.	52° 27' 58"	3494	53° 49' 48"	3497	55° 11' 34"	3430	56° 33' 16"	3433
	SATURN E.	32 51 55	3091	31 23 36	3097	29 55 23	3103	28 27 17	3100
	Regulus E.	33 40 44	3096	32 12 28	3103	30 44 21	3110	29 16 23	3117
	Spica E.	87 43 53	3083	86 15 23	3087	84 46 57	3091	83 18 36	3094
24	SUN W.	63 21 5	3442	64 42 33	3443	66 4 2	3442	67 25 30	3441
	Spica E.	75 57 39	3104	74 29 34	3105	73 1 31	3106	71 33 27	3106
	Antares E.	121 51 59	3104	120 23 55	3104	118 55 51	3103	117 27 46	3103
25	SUN W.	74 13 12	3433	75 34 52	3430	76 56 36	3425	78 18 24	3420
	Pollux W.	26 38 43	3190	28 6 28	3113	29 34 22	3104	31 2 27	3095
	Spica E.	64 13 9	3101	62 45 0	3099	61 16 50	3097	59 48 36	3094
	Mars E.	108 51 57	2952	107 20 44	2948	105 49 26	2945	104 18 4	2941
	Antares E.	110 6 48	3091	108 38 27	3087	107 10 2	3083	105 41 31	3079
26	SUN W.	85 8 55	3390	86 31 23	3381	87 54 0	3373	89 16 45	3365
	Pollux W.	38 25 18	3055	39 54 22	3047	41 23 36	3038	42 53 2	3039
	Spica E.	52 26 26	3075	50 57 45	3070	49 28 58	3065	48 0 5	3059
	Mars E.	96 39 45	2914	95 7 44	2907	93 35 34	2900	92 3 15	2899
	Antares E.	98 17 29	3050	96 48 18	3043	95 18 58	3035	93 49 30	3027
27	SUN W.	96 13 13	3316	97 37 6	3305	99 1 12	3293	100 25 33	3280
	Pollux W.	50 23 10	2978	51 53 51	2967	53 24 46	2955	54 55 56	2949
	Spica E.	40 33 58	3031	39 4 24	3025	37 34 43	3020	36 4 55	3015
	Mars E.	84 19 1	2848	82 45 34	2838	81 11 55	2827	79 38 1	2816
	Antares E.	86 19 28	2981	84 48 53	2971	83 18 5	2960	81 47 3	2949
28	SUN W.	107 31 2	3213	108 56 58	3198	110 23 9	3183	111 49 40	3168
	Pollux W.	62 35 41	2878	64 8 29	2864	65 41 35	2849	67 14 59	2834
	SATURN W.	27 3 38	2909	28 35 45	2893	30 8 12	2877	31 41 0	2861
	Regulus W.	26 44 55	2920	28 16 48	2900	29 49 6	2889	31 21 47	2885
	Mars E.	71 44 53	2756	70 9 26	2743	68 33 43	2730	66 57 42	2715
	Antares E.	74 8 13	2988	72 35 39	2975	71 2 49	2960	69 29 41	2948
29	SUN W.	119 7 1	3065	120 35 30	3067	122 4 20	3050	123 33 31	3039
	Pollux W.	75 6 51	2757	76 42 15	2741	78 18 0	2725	79 54 6	2708
	SATURN W.	39 30 19	2777	41 5 16	2760	42 40 35	2743	44 16 16	2727
	Regulus W.	39 11 3	2774	40 46 4	2756	42 21 29	2738	43 57 17	2721
	Antares E.	61 39 29	2777	60 4 30	2769	58 29 11	2747	56 53 32	2731
	α Aquilæ E.	107 9 57	3554	105 50 33	3525	104 30 37	3497	103 10 10	3471
30	Pollux W.	88 0 13	2925	89 38 34	2908	91 17 20	2891	92 56 28	2873
	SATURN W.	52 20 26	2939	53 58 26	2922	55 36 50	2905	57 15 38	2886
	Regulus W.	52 2 15	2931	53 40 27	2913	55 19 3	2895	56 58 3	2878
	Antares E.	48 50 16	2956	47 12 37	2940	45 34 37	2926	43 56 18	2912
	α Aquilæ E.	96 20 50	3353	94 57 40	3331	93 34 5	3312	92 10 8	3293
31	Pollux W.	101 18 5	2488	102 59 35	2471	104 41 29	2455	106 23 45	2438
	SATURN W.	65 35 36	2501	67 16 48	2484	68 58 24	2467	70 40 23	2450
	Regulus W.	65 19 12	2490	67 0 39	2473	68 42 30	2456	70 24 45	2438
	Antares E.	35 40 2	2550	33 59 57	2539	32 19 38	2530	30 39 6	2523
	α Aquilæ E.	85 5 16	3216	83 39 26	3205	82 13 23	3194	80 47 5	3184

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	SUN W.	57 54 55	3435	59 16 30	3437	60 38 3	3439	61 59 35	3441
	SATURN E.	26 59 19	3115	25 31 27	3121	24 3 43	3126	22 36 8	3131
	Regulus E.	27 48 34	3125	26 20 55	3134	24 53 27	3146	23 26 9	3164
	Spica E.	81 50 19	3097	80 22 4	3099	78 53 54	3101	77 25 45	3103
24	SUN W.	68 46 59	3440	70 8 29	3438	71 30 1	3437	72 51 35	3435
	Spica E.	70 5 25	3106	68 37 23	3105	67 9 19	3104	65 41 15	3103
	Antares E.	115 59 40	3109	114 31 30	3100	113 3 19	3097	111 35 5	3094
25	SUN W.	79 40 18	3416	81 2 17	3419	82 24 23	3405	83 46 36	3398
	Pollux W.	32 30 43	3089	33 59 6	3089	35 27 40	3073	36 56 24	3063
	Spica E.	58 20 19	3091	56 51 57	3087	55 23 32	3083	53 55 1	3079
	MARS E.	102 46 37	2936	101 15 4	2931	99 43 25	2926	98 11 39	2920
	Antares E.	104 12 56	3075	102 44 14	3070	101 15 26	3064	99 46 31	3057
26	SUN W.	90 39 41	3358	92 2 47	3349	93 26 4	3337	94 49 32	3326
	Pollux W.	44 22 39	3090	45 52 28	3010	47 22 20	2999	48 52 43	2986
	Spica E.	46 31 5	3054	45 1 59	3049	43 32 45	3043	42 3 26	3037
	MARS E.	90 30 46	2984	88 58 6	2976	87 25 16	2967	85 52 14	2956
	Antares E.	92 19 51	3019	90 50 3	3010	89 20 3	3001	87 49 52	2991
27	SUN W.	101 50 8	3267	103 14 57	3253	104 40 3	3240	106 5 24	3226
	Pollux W.	56 27 21	2930	57 59 1	2917	59 30 58	2904	61 3 11	2891
	Spica E.	34 35 1	3010	33 5 0	3006	31 34 55	3004	30 4 47	3003
	MARS E.	78 3 54	2953	76 29 31	2793	74 54 55	2781	73 20 2	2768
	Antares E.	80 15 47	2938	78 44 17	2926	77 12 31	2914	75 40 30	2901
28	SUN W.	113 16 29	3151	114 43 37	3134	116 11 5	3118	117 38 53	3101
	Pollux W.	68 48 42	2919	70 22 44	2904	71 57 6	2789	73 31 48	2773
	SATURN W.	33 14 9	2944	34 47 39	2927	36 21 31	2910	37 55 44	2794
	Regulus W.	32 54 51	2946	34 28 19	2928	36 2 11	2910	37 36 25	2792
	MARS E.	65 21 23	2701	63 44 45	2687	62 7 49	2673	60 30 33	2658
	Antares E.	67 56 16	2934	66 22 32	2920	64 48 30	2906	63 14 9	2791
29	SUN W.	125 3 4	3014	126 32 59	2996	128 3 17	2978	129 33 57	2959
	Pollux W.	81 30 35	2999	83 7 25	2975	84 44 38	2959	86 22 14	2941
	SATURN W.	45 52 20	2709	47 28 47	2691	49 5 36	2674	50 42 49	2657
	Regulus W.	45 33 29	2703	47 10 4	2685	48 47 4	2667	50 24 27	2649
	Antares E.	55 17 34	2716	53 41 15	2701	52 4 34	2686	50 27 35	2671
	α Aquilæ E.	101 49 14	3446	100 27 48	3490	99 5 56	3397	97 43 36	3374
30	Pollux W.	94 36 0	2557	96 15 56	2539	97 56 15	2522	99 36 59	2505
	SATURN W.	58 54 49	2570	60 34 25	2553	62 14 25	2536	63 54 49	2519
	Regulus W.	58 37 28	2560	60 17 17	2542	61 57 31	2524	63 38 9	2507
	Antares E.	42 17 39	2598	40 38 42	2584	38 59 26	2579	37 19 52	2560
	α Aquilæ E.	90 45 48	3275	89 21 8	3259	87 56 9	3243	86 30 51	3229
31	Pollux W.	108 6 25	2492	109 49 28	2406	111 32 54	2391	113 16 42	2375
	SATURN W.	72 22 46	2434	74 5 32	2418	75 48 42	2402	77 32 14	2386
	Regulus W.	72 7 24	2429	73 50 26	2406	75 33 52	2390	77 17 41	2374
	Antares E.	28 58 33	2519	27 17 36	2517	25 36 47	2515	23 55 55	2514
	α Aquilæ E.	79 20 37	3176	77 54 0	3170	76 27 15	3166	75 0 25	3163

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Added to Apparent Time.				
SUN.	1	^h 4 ^m 37 ^s 14.62	10.230	N.22° 5' 27.6	+20.19	15' 48.34	68.43	^m 2 ^s 25.93	0.373		
Mon.	2	4 41 20.34	10.246	22 13 20.6	19.22	15 48.21	68.48	2 16.79	0.389		
Tues.	3	4 45 26.44	10.262	22 20 50.4	18.25	15 48.08	68.53	2 7.27	0.405		
Wed.	4	4 49 32.91	10.277	22 27 56.7	+17.27	15 47.95	68.58	1 57.38	0.420		
Thur.	5	4 53 39.73	10.291	22 34 39.5	16.29	15 47.83	68.63	1 47.15	0.434		
Frid.	6	4 57 46.89	10.305	22 40 58.7	15.30	15 47.71	68.67	1 36.58	0.448		
Sat.	7	5 1 54.38	10.318	22 46 54.1	+14.31	15 47.59	68.71	1 25.68	0.461		
SUN.	8	5 6 2.17	10.330	22 52 25.5	13.31	15 47.48	68.75	1 14.48	0.473		
Mon.	9	5 10 10.25	10.342	22 57 33.0	12.31	15 47.37	68.79	1 3.00	0.485		
Tues.	10	5 14 18.59	10.353	23 2 16.3	+11.30	15 47.26	68.82	0 51.24	0.496		
Wed.	11	5 18 27.19	10.363	23 6 35.4	10.29	15 47.16	68.85	0 39.23	0.506		
Thur.	12	5 22 36.01	10.372	23 10 30.1	9.27	15 47.06	68.88	0 27.01	0.515		
Frid.	13	5 26 45.03	10.380	23 14 0.3	+ 8.25	15 46.97	68.90	0 14.58	0.523		
Sat.	14	5 30 54.23	10.386	23 17 6.0	7.23	15 46.88	68.92	0 1.97	0.529		
SUN.	15	5 35 3.57	10.392	23 19 47.0	6.20	15 46.80	68.94	0 10.78	0.535		
Mon.	16	5 39 13.04	10.396	23 22 3.4	+ 5.17	15 46.72	68.95	0 23.65	0.539		
Tues.	17	5 43 22.61	10.399	23 23 55.1	4.14	15 46.65	68.96	0 36.63	0.542		
Wed.	18	5 47 32.24	10.401	23 25 22.0	3.10	15 46.58	68.97	0 49.66	0.544		
Thur.	19	5 51 41.91	10.403	23 26 24.1	+ 2.07	15 46.52	68.97	1 2.74	0.546		
Frid.	20	5 55 51.60	10.403	23 27 1.3	+ 1.04	15 46.47	68.97	1 15.84	0.546		
Sat.	21	6 0 1.27	10.402	23 27 13.7	0.00	15 46.42	68.97	1 28.91	0.545		
SUN.	22	6 4 10.90	10.399	23 27 1.2	- 1.03	15 46.38	68.97	1 41.95	0.542		
Mon.	23	6 8 20.47	10.396	23 26 23.9	2.07	15 46.34	68.96	1 54.93	0.539		
Tues.	24	6 12 29.95	10.391	23 25 21.8	3.10	15 46.31	68.95	2 7.81	0.534		
Wed.	25	6 16 39.30	10.386	23 23 54.9	- 4.13	15 46.28	68.94	2 20.57	0.529		
Thur.	26	6 20 48.51	10.379	23 22 3.3	5.16	15 46.25	68.92	2 33.19	0.522		
Frid.	27	6 24 57.56	10.372	23 19 47.1	6.19	15 46.23	68.90	2 45.64	0.515		
Sat.	28	6 29 6.42	10.364	23 17 6.3	- 7.21	15 46.21	68.88	2 57.91	0.507		
SUN.	29	6 33 15.08	10.355	23 14 0.9	8.23	15 46.20	68.85	3 9.98	0.498		
Mon.	30	6 37 23.51	10.345	23 10 31.1	9.24	15 46.19	68.82	3 21.82	0.488		
Tues.	31	6 41 31.70	10.335	N.23 6 37.0	-10.25	15 46.18	68.78	3 33.42	0.478		

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign - indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
SUN.	1	^h 4 ^m 37 ^s 15.04	10.229	N. 22° 5' 28.4"	+20.19	^m 2 ^s 25.92	0.373	^h 4 ^m 39 ^s 40.96	
Mon.	2	4 41 20.74	10.245	22 13 21.3	19.22	2 16.78	0.389	4 43 37.51	
Tues.	3	4 45 26.81	10.261	22 20 51.0	18.25	2 7.26	0.405	4 47 34.07	
Wed.	4	4 49 33.25	10.276	22 27 57.3	+17.27	1 57.37	0.420	4 51 30.62	
Thur.	5	4 53 40.04	10.290	22 34 40.0	16.29	1 47.14	0.434	4 55 27.18	
Frid.	6	4 57 47.17	10.304	22 40 59.1	15.30	1 36.57	0.448	4 59 23.74	
Sat.	7	5 1 54.63	10.317	22 46 54.4	+14.31	1 25.67	0.461	5 3 20.30	
SUN.	8	5 6 2.39	10.329	22 52 25.8	13.31	1 14.47	0.473	5 7 16.86	
Mon.	9	5 10 10.43	10.341	22 57 33.2	12.31	1 2.99	0.485	5 11 13.42	
Tues.	10	5 14 18.74	10.352	23 2 16.5	+11.30	0 51.23	0.496	5 15 9.97	
Wed.	11	5 18 27.30	10.362	23 6 35.5	10.29	0 39.22	0.506	5 19 6.53	
Thur.	12	5 22 36.09	10.371	23 10 30.1	9.27	0 27.00	0.515	5 23 3.09	
Frid.	13	5 26 45.07	10.379	23 14 0.3	+ 8.25	0 14.58	0.523	5 26 59.65	
Sat.	14	5 30 54.23	10.385	23 17 6.0	7.23	0 1.97	0.529	5 30 56.20	
SUN.	15	5 35 3.54	10.391	23 19 47.0	6.20	0 10.78	0.535	5 34 52.76	
Mon.	16	5 39 12.97	10.395	23 22 3.4	+ 5.17	0 23.65	0.539	5 38 49.32	
Tues.	17	5 43 22.50	10.398	23 23 55.1	4.14	0 36.62	0.542	5 42 45.88	
Wed.	18	5 47 32.09	10.400	23 25 22.0	3.10	0 49.65	0.544	5 46 42.44	
Thur.	19	5 51 41.73	10.402	23 26 24.1	+ 2.07	1 2.73	0.546	5 50 39.00	
Frid.	20	5 55 51.38	10.402	23 27 1.3	+ 1.04	1 15.83	0.546	5 54 35.55	
Sat.	21	6 0 1.01	10.401	23 27 13.7	0.00	1 28.90	0.545	5 58 32.11	
SUN.	22	6 4 10.61	10.398	23 27 1.3	- 1.03	1 41.94	0.542	6 2 28.67	
Mon.	23	6 8 20.15	10.395	23 26 24.0	2.07	1 54.92	0.539	6 6 25.23	
Tues.	24	6 12 29.58	10.390	23 25 21.9	3.10	2 7.80	0.534	6 10 21.78	
Wed.	25	6 16 38.89	10.385	23 23 55.1	- 4.13	2 20.55	0.529	6 14 18.34	
Thur.	26	6 20 48.07	10.378	23 22 3.6	5.16	2 33.17	0.522	6 18 14.90	
Frid.	27	6 24 57.08	10.371	23 19 47.4	6.19	2 45.62	0.515	6 22 11.46	
Sat.	28	6 29 5.91	10.363	23 17 6.6	- 7.21	2 57.89	0.507	6 26 8.02	
SUN.	29	6 33 14.53	10.354	23 14 1.3	8.23	3 9.95	0.498	6 30 4.58	
Mon.	30	6 37 22.92	10.344	23 10 31.6	9.24	3 21.79	0.488	6 34 1.13	
Tues.	31	6 41 31.08	10.334	N. 23 6 37.6	-10.25	3 33.39	0.478	6 37 57.69	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
 The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing

Diff. for 1 hour,
 + 9".8565.
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	152	70° 53' 55".1	53' 52".1	143.60	+ 0.44	0.0062099	+25.4	^h 19 ^m 17 ^s 8.96
2	153	71 51 21.0	51 17.8	143.55	0.32	0.0062703	24.9	19 13 13.05
3	154	72 48 45.8	48 42.5	143.51	0.19	0.0063295	24.4	19 9 17.14
4	155	73 46 9.7	46 6.3	143.48	+ 0.06	0.0063874	+23.9	19 5 21.22
5	156	74 43 32.9	43 29.3	143.45	— 0.07	0.0064441	23.3	19 1 25.31
6	157	75 40 55.4	40 51.6	143.42	0.19	0.0064994	22.8	18 57 29.40
7	158	76 38 17.2	38 13.2	143.40	— 0.29	0.0065533	+22.2	18 53 33.49
8	159	77 35 38.4	35 34.2	143.37	0.37	0.0066057	21.5	18 49 37.57
9	160	78 32 59.2	32 54.8	143.35	0.42	0.0066564	20.8	18 45 41.66
10	161	79 30 19.5	30 15.0	143.33	— 0.44	0.0067053	+20.0	18 41 45.75
11	162	80 27 39.4	27 34.7	143.31	0.42	0.0067522	19.2	18 37 49.84
12	163	81 24 58.9	24 54.0	143.29	0.38	0.0067971	18.3	18 33 53.92
13	164	82 22 17.9	22 12.8	143.28	— 0.31	0.0068398	+17.3	18 29 58.01
14	165	83 19 36.5	19 31.2	143.26	0.22	0.0068801	16.3	18 26 2.10
15	166	84 16 54.7	16 49.3	143.25	— 0.12	0.0069180	15.3	18 22 6.19
16	167	85 14 12.5	14 6.9	143.23	+ 0.01	0.0069533	+14.2	18 18 10.27
17	168	86 11 29.8	11 24.0	143.21	0.14	0.0069861	13.1	18 14 14.36
18	169	87 8 46.7	8 40.7	143.19	0.27	0.0070163	12.0	18 10 18.45
19	170	88 6 3.1	5 56.9	143.17	+ 0.39	0.0070439	+10.9	18 6 22.54
20	171	89 3 18.9	3 12.6	143.15	0.50	0.0070689	9.9	18 2 26.63
21	172	90 0 34.1	0 27.7	143.13	0.59	0.0070914	8.9	17 58 30.72
22	173	90 57 48.8	57 42.2	143.10	+ 0.65	0.0071115	+ 7.9	17 54 34.81
23	174	91 55 3.0	54 56.1	143.08	0.68	0.0071292	6.9	17 50 38.90
24	175	92 52 16.5	52 9.4	143.05	0.68	0.0071447	6.0	17 46 42.98
25	176	93 49 29.4	49 22.2	143.03	+ 0.66	0.0071582	+ 5.2	17 42 47.07
26	177	94 46 41.9	46 34.5	143.01	0.60	0.0071698	4.4	17 38 51.16
27	178	95 43 53.9	43 46.3	142.99	0.51	0.0071794	3.6	17 34 55.25
28	179	96 41 5.5	40 57.7	142.97	+ 0.41	0.0071872	+ 2.9	17 30 59.33
29	180	97 38 16.7	38 8.7	142.96	0.30	0.0071934	2.3	17 27 3.42
30	181	98 35 27.6	35 19.4	142.95	0.17	0.0071981	1.7	17 23 7.51
31	182	99 32 38.3	32 30.0	142.94	+ 0.03	0.0072014	+ 1.1	17 19 11.60
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0.								Diff. for 1 Hour, — 9 ^s .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
							^h ^m	^m	^d
1	16' 12"	16' 7.5"	58' 41.1"	+1.98	59' 4.1"	+1.84	10 46.3	2.24	13.7
2	16 13.2	16 18.2	59 25.1	1.65	59 43.6	1.42	11 42.3	2.42	14.7
3	16 22.5	16 25.8	59 59.2	1.16	60 11.4	0.87	12 42.5	2.57	15.7
4	16 28.2	16 29.5	60 20.1	+0.57	60 25.1	+0.26	13 45.6	2.64	16.7
5	16 29.8	16 29.2	60 26.3	-0.04	60 24.0	-0.33	14 49.2	2.61	17.7
6	16 27.7	16 25.4	60 18.4	0.59	60 9.8	0.83	15 50.7	2.48	18.7
7	16 22.3	16 18.6	59 58.5	-1.03	59 45.0	-1.20	16 48.4	2.32	19.7
8	16 14.4	16 9.9	59 29.7	1.33	59 13.0	1.43	17 42.0	2.18	20.7
9	16 5.1	16 0.1	58 55.3	1.50	58 37.1	1.53	18 32.0	2.03	21.7
10	15 55.1	15 50.0	58 18.6	-1.55	58 0.0	-1.54	19 19.5	1.93	22.7
11	15 45.0	15 40.1	57 41.6	1.52	57 23.5	1.49	20 5.6	1.91	23.7
12	15 35.3	15 30.6	57 5.8	1.45	56 48.7	1.41	20 51.4	1.92	24.7
13	15 26.1	15 21.8	56 32.1	-1.36	56 16.2	-1.30	21 37.8	1.96	25.7
14	15 17.6	15 13.6	56 0.9	1.25	55 46.3	1.19	22 25.5	2.02	26.7
15	15 9.8	15 6.2	55 32.4	1.13	55 19.1	1.07	23 14.6	2.07	27.7
16	15 2.8	14 59.6	55 6.6	-1.00	54 55.0	-0.93	24 0.0	2.10	28.7
17	14 56.7	14 54.0	54 44.2	0.86	54 34.4	0.77	0 4.9	2.10	0.1
18	14 51.7	14 49.6	54 25.7	0.68	54 18.1	0.58	0 55.6	2.10	1.1
19	14 47.9	14 46.6	54 11.8	-0.46	54 7.0	-0.34	1 45.9	2.07	2.1
20	14 45.7	14 45.3	54 3.7	-0.20	54 2.2	-0.05	2 34.9	2.00	3.1
21	14 45.4	14 46.0	54 2.6	+0.11	54 4.9	+0.28	3 22.0	1.92	4.1
22	14 47.2	14 49.1	54 9.4	+0.47	54 16.1	+0.66	4 7.2	1.85	5.1
23	14 51.5	14 54.6	54 25.1	0.85	54 36.5	1.05	4 50.7	1.79	6.1
24	14 58.4	15 2.8	54 50.3	1.25	55 6.5	1.45	5 33.1	1.77	7.1
25	15 7.8	15 13.5	55 25.0	+1.64	55 45.8	+1.82	6 15.5	1.78	8.1
26	15 19.7	15 26.4	56 8.6	1.98	56 33.3	2.12	6 58.7	1.84	9.1
27	15 33.6	15 41.0	56 59.6	2.24	57 27.0	2.32	7 44.0	1.95	10.1
28	15 48.7	15 56.5	57 55.2	+2.36	58 23.7	+2.36	8 32.5	2.11	11.1
29	16 4.1	16 11.5	58 51.8	2.30	59 18.8	2.19	9 25.5	2.31	12.1
30	16 18.4	16 24.6	59 44.2	2.02	60 7.2	1.80	10 23.4	2.50	13.1
31	16 30.1	16 34.6	60 27.3	+1.52	60 43.7	+1.20	11 25.7	2.65	14.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 1.					TUESDAY 3.				
0	15 3 8.55	2.9477	S. 14° 0' 2.3	12.148	0	16 58 58.57	2.5739	S. 21° 58' 26.4	7.114
1	15 5 23.61	2.9543	14 12 9.3	12.084	1	17 1 33.18	2.5798	22 5 28.9	6.967
2	15 7 39.07	2.9610	14 24 12.4	12.017	2	17 4 8.14	2.5856	22 12 22.5	6.819
3	15 9 54.93	2.9677	14 36 11.4	11.949	3	17 6 43.45	2.5913	22 19 7.2	6.670
4	15 12 11.19	2.9744	14 48 6.3	11.881	4	17 9 19.10	2.5970	22 25 42.9	6.519
5	15 14 27.86	2.9812	14 59 57.1	11.811	5	17 11 55.09	2.6026	22 32 9.5	6.367
6	15 16 44.94	2.9881	15 11 43.6	11.738	6	17 14 31.41	2.6080	22 38 26.9	6.213
7	15 19 2.43	2.9949	15 23 25.7	11.664	7	17 17 8.05	2.6134	22 44 35.1	6.057
8	15 21 20.33	2.3018	15 35 3.3	11.588	8	17 19 45.00	2.6184	22 50 33.8	5.899
9	15 23 38.65	2.3087	15 46 36.3	11.511	9	17 22 22.26	2.6235	22 56 23.0	5.741
10	15 25 57.38	2.3157	15 58 4.6	11.432	10	17 24 59.82	2.6285	23 2 2.7	5.582
11	15 28 16.53	2.3226	16 9 28.1	11.351	11	17 27 37.68	2.6333	23 7 32.9	5.422
12	15 30 36.09	2.3295	16 20 46.7	11.268	12	17 30 15.82	2.6380	23 12 53.4	5.261
13	15 32 56.07	2.3366	16 32 0.3	11.183	13	17 32 54.24	2.6427	23 18 4.2	5.097
14	15 35 16.48	2.3437	16 43 8.7	11.097	14	17 35 32.94	2.6473	23 23 5.1	4.933
15	15 37 37.31	2.3507	16 54 11.9	11.008	15	17 38 11.91	2.6516	23 27 56.1	4.767
16	15 39 58.56	2.3577	17 5 9.7	10.918	16	17 40 51.13	2.6558	23 32 37.2	4.601
17	15 42 20.23	2.3647	17 16 2.1	10.827	17	17 43 30.60	2.6599	23 37 8.2	4.433
18	15 44 42.33	2.3718	17 26 49.0	10.734	18	17 46 10.32	2.6639	23 41 29.1	4.264
19	15 47 4.85	2.3789	17 37 30.2	10.639	19	17 48 50.27	2.6677	23 45 39.9	4.095
20	15 49 27.0	2.3860	17 48 5.6	10.543	20	17 51 30.44	2.6712	23 49 40.5	3.924
21	15 51 51.17	2.3931	17 58 35.2	10.443	21	17 54 10.82	2.6747	23 53 30.8	3.752
22	15 54 14.97	2.4002	18 8 58.8	10.342	22	17 56 51.41	2.6789	23 57 10.7	3.579
23	15 56 39.19	2.4073	S. 18 19 16.3	10.240	23	17 59 32.20	2.6814	S. 24 0 40.3	3.406
MONDAY 2.					WEDNESDAY 4.				
0	15 59 3.83	2.4143	S. 18 29 27.6	10.136	0	18 2 13.18	2.6845	S. 24 3 59.5	3.232
1	16 1 28.89	2.4213	18 39 32.6	10.030	1	18 4 54.34	2.6874	24 7 8.2	3.057
2	16 3 54.38	2.4284	18 49 31.2	9.922	2	18 7 35.67	2.6902	24 10 6.4	2.882
3	16 6 20.30	2.4355	18 59 23.3	9.813	3	18 10 17.16	2.6937	24 12 54.0	2.705
4	16 8 46.64	2.4424	19 9 8.8	9.702	4	18 12 58.80	2.6964	24 15 31.0	2.528
5	16 11 13.39	2.4493	19 18 47.5	9.588	5	18 15 40.58	2.6975	24 17 57.4	2.351
6	16 13 40.56	2.4563	19 28 19.4	9.474	6	18 18 22.50	2.6997	24 20 13.1	2.172
7	16 16 8.15	2.4632	19 37 44.4	9.357	7	18 21 4.54	2.7016	24 22 18.1	1.993
8	16 18 36.15	2.4702	19 47 2.3	9.239	8	18 23 46.69	2.7033	24 24 12.3	1.813
9	16 21 4.57	2.4771	19 56 13.1	9.119	9	18 26 28.94	2.7050	24 25 55.7	1.633
10	16 23 33.40	2.4839	20 5 16.6	8.997	10	18 29 11.29	2.7065	24 27 28.3	1.453
11	16 26 2.64	2.4907	20 14 12.7	8.873	11	18 31 53.72	2.7077	24 28 50.1	1.273
12	16 28 32.28	2.4974	20 23 1.4	8.748	12	18 34 36.22	2.7088	24 30 1.1	1.092
13	16 31 2.33	2.5041	20 31 42.5	8.621	13	18 37 18.78	2.7098	24 31 1.2	0.911
14	16 33 32.78	2.5108	20 40 15.9	8.492	14	18 40 1.40	2.7107	24 31 50.4	0.729
15	16 36 3.63	2.5174	20 48 41.6	8.362	15	18 42 44.06	2.7113	24 32 28.7	0.547
16	16 38 34.87	2.5239	20 56 59.4	8.230	16	18 45 26.75	2.7117	24 32 56.1	0.366
17	16 41 6.50	2.5305	21 5 9.2	8.097	17	18 48 9.46	2.7119	24 33 12.6	0.184
18	16 43 38.53	2.5370	21 13 11.0	7.962	18	18 50 52.18	2.7120	24 33 18.2	- 0.003
19	16 46 10.94	2.5433	21 21 4.6	7.824	19	18 53 34.90	2.7119	24 33 12.0	+ 0.179
20	16 48 43.72	2.5495	21 28 49.9	7.685	20	18 56 17.61	2.7117	24 32 56.7	0.382
21	16 51 16.88	2.5557	21 36 26.8	7.545	21	18 59 0.31	2.7113	24 32 29.5	0.544
22	16 53 50.41	2.5619	21 43 55.3	7.403	22	19 1 42.97	2.7107	24 31 51.4	0.725
23	16 56 24.31	2.5680	21 51 15.2	7.259	23	19 4 25.59	2.7099	24 31 2.5	0.906
24	16 58 58.57	2.5739	S. 21 58 20.4	7.114	24	19 7 8.16	2.7090	S. 24 30 2.7	1.087

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
0	^h 19 ^m 7 ^s 8.16	2.7090	S. 24° 30' 2.7"	1.087	0	^h 21 ^m 13 ^s 19.94	2.5057	S. 20° 22' 46.4"	8.788
1	19 9 50.67	2.7079	24 28 52.0	1.988	1	21 15 50.09	2.4993	20 13 55.6	8.910
2	19 12 33.11	2.7067	24 27 30.5	1.449	2	21 18 19.85	2.4928	20 4 57.2	9.036
3	19 15 15.47	2.7053	24 25 58.1	1.630	3	21 20 49.23	2.4864	19 55 51.3	9.161
4	19 17 57.74	2.7037	24 24 14.9	1.809	4	21 23 18.22	2.4799	19 46 37.9	9.284
5	19 20 39.91	2.7018	24 22 21.0	1.988	5	21 25 46.62	2.4735	19 37 17.2	9.405
6	19 23 21.96	2.6998	24 20 16.3	2.167	6	21 28 15.04	2.4671	19 27 49.3	9.524
7	19 26 3.89	2.6978	24 18 0.9	2.346	7	21 30 42.87	2.4605	19 18 14.3	9.642
8	19 28 45.70	2.6957	24 15 34.8	2.524	8	21 33 10.30	2.4538	19 8 32.3	9.758
9	19 31 27.37	2.6933	24 12 58.0	2.701	9	21 35 37.33	2.4472	18 58 43.4	9.873
10	19 34 8.89	2.6908	24 10 10.6	2.877	10	21 38 3.97	2.4407	18 48 47.6	9.986
11	19 36 50.26	2.6881	24 7 12.7	3.053	11	21 40 30.22	2.4342	18 38 45.1	10.098
12	19 39 31.46	2.6854	24 4 4.2	3.230	12	21 42 56.07	2.4276	18 28 36.1	10.204
13	19 42 12.48	2.6826	24 0 45.2	3.403	13	21 45 21.53	2.4210	18 18 20.6	10.319
14	19 44 53.32	2.6791	23 57 15.8	3.577	14	21 47 46.59	2.4144	18 7 58.6	10.419
15	19 47 33.97	2.6756	23 53 36.0	3.750	15	21 50 11.26	2.4078	17 57 30.3	10.523
16	19 50 14.41	2.6723	23 49 45.8	3.922	16	21 52 35.53	2.4012	17 46 55.8	10.626
17	19 52 54.64	2.6688	23 45 45.3	4.093	17	21 54 59.41	2.3947	17 36 15.2	10.727
18	19 55 34.66	2.6651	23 41 34.6	4.263	18	21 57 22.90	2.3882	17 25 28.6	10.826
19	19 58 14.45	2.6612	23 37 13.7	4.432	19	21 59 46.00	2.3817	17 14 36.1	10.923
20	20 0 54.00	2.6572	23 32 42.7	4.600	20	22 2 8.70	2.3751	17 3 37.8	11.019
21	20 3 33.31	2.6531	23 28 1.7	4.767	21	22 4 31.01	2.3686	16 52 33.8	11.113
22	20 6 12.37	2.6489	23 23 10.7	4.933	22	22 6 52.93	2.3621	16 41 24.2	11.206
23	20 8 51.18	2.6446	S. 23 18 9.7	5.098	23	22 9 14.46	2.3557	S. 16 30 9.1	11.297
FRIDAY 6.					SUNDAY 8.				
0	20 11 29.72	2.6401	S. 23 12 58.9	5.262	0	22 11 35.61	2.3492	S. 16 18 48.6	11.386
1	20 14 7.19	2.6355	23 7 38.3	5.434	1	22 13 56.37	2.3426	16 7 22.8	11.473
2	20 16 45.98	2.6307	23 2 8.0	5.606	2	22 16 16.75	2.3365	15 55 51.8	11.559
3	20 19 23.68	2.6259	22 56 28.0	5.746	3	22 18 36.75	2.3301	15 44 15.7	11.643
4	20 22 1.09	2.6211	22 50 38.5	5.904	4	22 20 56.37	2.3238	15 32 34.6	11.726
5	20 24 38.21	2.6161	22 44 39.5	6.062	5	22 23 15.61	2.3176	15 20 48.6	11.807
6	20 27 15.02	2.6109	22 38 31.1	6.218	6	22 25 34.48	2.3113	15 8 57.8	11.886
7	20 29 51.52	2.6057	22 32 13.4	6.373	7	22 27 52.97	2.3051	14 57 2.3	11.963
8	20 32 27.71	2.6005	22 25 46.4	6.527	8	22 30 11.09	2.2989	14 45 2.2	12.039
9	20 35 3.58	2.5951	22 19 10.2	6.679	9	22 32 28.84	2.2928	14 32 57.6	12.113
10	20 37 39.12	2.5896	22 12 24.9	6.830	10	22 34 46.23	2.2868	14 20 48.6	12.187
11	20 40 14.33	2.5840	22 5 30.6	6.979	11	22 37 3.26	2.2808	14 8 35.2	12.259
12	20 42 49.20	2.5784	21 58 27.4	7.127	12	22 39 19.93	2.2748	13 56 17.5	12.329
13	20 45 23.73	2.5727	21 51 15.4	7.273	13	22 41 36.24	2.2688	13 43 55.7	12.397
14	20 47 57.92	2.5669	21 43 54.6	7.418	14	22 43 52.19	2.2629	13 31 29.9	12.463
15	20 50 31.76	2.5610	21 36 25.2	7.562	15	22 46 7.79	2.2572	13 19 0.2	12.528
16	20 53 5.24	2.5550	21 28 47.2	7.703	16	22 48 23.05	2.2515	13 6 26.6	12.591
17	20 55 38.36	2.5491	21 21 0.8	7.843	17	22 50 37.97	2.2457	12 53 49.3	12.652
18	20 58 11.13	2.5430	21 13 6.0	7.982	18	22 52 52.54	2.2400	12 41 8.3	12.713
19	21 0 43.53	2.5369	21 5 2.9	8.120	19	22 55 6.77	2.2344	12 28 23.7	12.772
20	21 3 15.56	2.5307	20 56 51.6	8.256	20	22 57 20.67	2.2289	12 15 35.7	12.828
21	21 5 47.22	2.5245	20 48 32.2	8.390	21	22 59 34.24	2.2234	12 2 44.3	12.884
22	21 8 18.50	2.5182	20 40 4.8	8.522	22	23 1 47.48	2.2180	11 49 49.6	12.939
23	21 10 49.41	2.5119	20 31 29.5	8.653	23	23 4 0.40	2.2126	11 36 51.6	12.992
24	21 13 19.94	2.5057	S. 20 22 46.4	8.782	24	23 6 12.99	2.2073	S. 11 23 50.5	13.043

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 9.					WEDNESDAY 11.				
0	^h 23 ^m 6 ^s 12.99	2.3073	S. 11° 23' 50.5	13.043	0	^h 0 47 ^m 21.95	2.0354	S. 0° 24' 35.4	13.945
1	23 8 25.27	2.3021	11 10 46.4	13.093	1	0 49 24.02	2.0337	S. 0 10 39.0	13.935
2	23 10 37.24	2.1969	10 57 39.4	13.141	2	0 51 25.99	2.0330	N. 0 3 16.8	13.934
3	23 12 48.90	2.1917	10 44 29.5	13.188	3	0 53 27.86	2.0303	0 17 11.9	13.919
4	23 15 0.25	2.1867	10 31 16.8	13.234	4	0 55 29.63	2.0287	0 31 6.2	13.896
5	23 17 11.30	2.1817	10 18 1.4	13.277	5	0 57 31.30	2.0272	0 44 59.6	13.883
6	23 19 22.05	2.1768	10 4 43.5	13.319	6	0 59 32.89	2.0258	0 58 52.2	13.868
7	23 21 32.51	2.1719	9 51 23.1	13.361	7	1 1 34.40	2.0245	1 12 43.8	13.858
8	23 23 42.68	2.1671	9 38 0.2	13.402	8	1 3 35.83	2.0230	1 26 34.4	13.834
9	23 25 52.56	2.1623	9 24 34.9	13.446	9	1 5 37.19	2.0220	1 40 23.9	13.816
10	23 28 2.16	2.1577	9 11 7.4	13.477	10	1 7 38.47	2.0208	1 54 12.3	13.797
11	23 30 11.49	2.1532	8 57 37.7	13.519	11	1 9 39.69	2.0198	2 7 59.5	13.776
12	23 32 20.55	2.1487	8 44 6.0	13.545	12	1 11 40.85	2.0188	2 21 45.4	13.754
13	23 34 29.34	2.1442	8 30 32.3	13.578	13	1 13 41.95	2.0179	2 35 30.0	13.738
14	23 36 37.86	2.1396	8 16 56.6	13.611	14	1 15 43.00	2.0170	2 49 13.2	13.708
15	23 38 46.12	2.1355	8 3 18.9	13.642	15	1 17 43.99	2.0163	3 2 55.0	13.684
16	23 40 54.12	2.1313	7 49 39.5	13.670	16	1 19 44.94	2.0155	3 16 35.3	13.658
17	23 43 1.88	2.1272	7 35 58.5	13.697	17	1 21 45.85	2.0149	3 30 14.0	13.631
18	23 45 9.39	2.1232	7 22 15.9	13.723	18	1 23 46.73	2.0144	3 43 51.0	13.604
19	23 47 16.66	2.1192	7 8 31.7	13.748	19	1 25 47.58	2.0138	3 57 26.4	13.576
20	23 49 23.69	2.1152	6 54 46.1	13.772	20	1 27 48.39	2.0133	4 11 0.1	13.547
21	23 51 30.48	2.1113	6 40 59.1	13.794	21	1 29 49.17	2.0129	4 24 32.0	13.516
22	23 53 37.04	2.1075	6 27 10.8	13.816	22	1 31 49.93	2.0126	4 38 2.0	13.484
23	23 55 43.38	2.1038	S. 6 13 21.2	13.836	23	1 33 50.68	2.0123	N. 4 51 30.0	13.451
TUESDAY 10.					THURSDAY 12.				
0	23 57 49.50	2.1002	S. 5 59 30.5	13.854	0	1 35 51.41	2.0121	N. 5 4 56.1	13.418
1	23 59 55.41	2.0966	5 45 38.7	13.872	1	1 37 52.13	2.0120	5 18 20.2	13.384
2	0 2 1.10	2.0931	5 31 45.9	13.888	2	1 39 52.85	2.0120	5 31 42.2	13.349
3	0 4 6.58	2.0897	5 17 52.2	13.903	3	1 41 53.57	2.0119	5 45 2.1	13.313
4	0 6 11.86	2.0864	5 3 57.7	13.915	4	1 43 54.28	2.0119	5 58 19.8	13.276
5	0 8 16.95	2.0832	4 50 2.4	13.928	5	1 45 55.00	2.0121	6 11 35.2	13.238
6	0 10 21.84	2.0799	4 36 6.3	13.940	6	1 47 55.73	2.0123	6 24 48.3	13.199
7	0 12 26.54	2.0768	4 22 9.6	13.950	7	1 49 56.47	2.0125	6 37 59.1	13.159
8	0 14 31.06	2.0738	4 8 12.3	13.959	8	1 51 57.23	2.0128	6 51 7.4	13.118
9	0 16 35.40	2.0709	3 54 14.5	13.967	9	1 53 58.01	2.0129	7 4 13.2	13.076
10	0 18 39.57	2.0680	3 40 16.3	13.973	10	1 55 58.81	2.0135	7 17 16.5	13.033
11	0 20 43.56	2.0651	3 26 17.8	13.978	11	1 57 59.63	2.0139	7 30 17.2	12.989
12	0 22 47.38	2.0623	3 12 19.0	13.983	12	2 0 0.48	2.0145	7 43 15.2	12.944
13	0 24 51.04	2.0597	2 58 20.0	13.985	13	2 2 1.37	2.0152	7 56 10.5	12.899
14	0 26 54.55	2.0572	2 44 20.8	13.987	14	2 4 2.30	2.0158	8 9 3.1	12.853
15	0 28 57.91	2.0547	2 30 21.5	13.988	15	2 6 3.26	2.0164	8 21 52.9	12.806
16	0 31 1.12	2.0523	2 16 22.2	13.988	16	2 8 4.27	2.0171	8 34 39.8	12.758
17	0 33 4.18	2.0498	2 2 22.9	13.987	17	2 10 5.32	2.0176	8 47 23.8	12.700
18	0 35 7.10	2.0475	1 48 23.8	13.983	18	2 12 6.42	2.0187	9 0 4.9	12.659
19	0 37 9.88	2.0453	1 34 24.9	13.979	19	2 14 7.57	2.0197	9 12 42.9	12.606
20	0 39 12.54	2.0430	1 20 26.3	13.974	20	2 16 8.78	2.0207	9 25 17.8	12.556
21	0 41 15.07	2.0412	1 6 28.0	13.969	21	2 18 10.05	2.0217	9 37 49.6	12.504
22	0 43 17.48	2.0392	0 52 30.0	13.963	22	2 20 11.38	2.0227	9 50 18.2	12.450
23	0 45 19.77	2.0372	0 38 32.4	13.955	23	2 22 12.78	2.0236	10 2 43.6	12.395
24	0 47 21.95	2.0354	S. 0 24 35.4	13.945	24	2 24 14.24	2.0249	N. 10 15 5.6	12.339

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 13.					SUNDAY 15.				
0	2 24 14.24	2.0949	N.10 15 5.6	12.339	0	4 3 27.39	2.1186	N.18 47 14.3	8.688
1	2 26 15.77	2.0961	10 27 24.3	12.983	1	4 5 34.58	2.1210	18 55 52.6	8.590
2	2 28 17.38	2.0974	10 39 39.6	12.998	2	4 7 41.91	2.1233	19 4 25.1	8.494
3	2 30 19.06	2.0987	10 51 51.4	12.168	3	4 9 49.37	2.1255	19 12 51.9	8.398
4	2 32 20.82	2.0300	11 3 59.7	12.109	4	4 11 56.97	2.1277	19 21 12.9	8.301
5	2 34 22.66	2.0314	11 16 4.5	12.049	5	4 14 4.70	2.1300	19 29 28.0	8.203
6	2 36 24.59	2.0328	11 28 5.6	11.988	6	4 16 12.57	2.1323	19 37 37.2	8.104
7	2 38 26.60	2.0342	11 40 3.0	11.926	7	4 18 20.58	2.1346	19 45 40.5	8.005
8	2 40 28.70	2.0357	11 51 56.7	11.864	8	4 20 28.73	2.1369	19 53 37.8	7.904
9	2 42 30.89	2.0373	12 3 46.7	11.802	9	4 22 37.01	2.1391	20 1 29.0	7.803
10	2 44 33.18	2.0389	12 15 32.9	11.738	10	4 24 45.42	2.1413	20 9 14.1	7.701
11	2 46 35.56	2.0405	12 27 15.2	11.678	11	4 26 53.97	2.1436	20 16 53.1	7.599
12	2 48 38.04	2.0422	12 38 53.5	11.615	12	4 29 2.65	2.1458	20 24 26.0	7.497
13	2 50 40.62	2.0439	12 50 27.8	11.553	13	4 31 11.46	2.1479	20 31 52.7	7.393
14	2 52 43.30	2.0456	13 1 58.1	11.471	14	4 33 20.40	2.1501	20 39 13.2	7.289
15	2 54 46.09	2.0474	13 13 24.4	11.403	15	4 35 29.47	2.1522	20 46 27.4	7.185
16	2 56 48.99	2.0493	13 24 46.5	11.333	16	4 37 38.67	2.1544	20 53 35.4	7.080
17	2 58 52.00	2.0510	13 36 4.4	11.263	17	4 39 48.00	2.1565	21 0 37.0	6.974
18	3 0 55.11	2.0528	13 47 18.1	11.192	18	4 41 57.45	2.1585	21 7 32.3	6.868
19	3 2 58.34	2.0547	13 58 27.5	11.120	19	4 44 7.02	2.1606	21 14 21.2	6.761
20	3 5 1.68	2.0567	14 9 32.5	11.047	20	4 46 16.72	2.1627	21 21 3.6	6.653
21	3 7 5.14	2.0587	14 20 33.2	10.974	21	4 48 26.54	2.1647	21 27 39.6	6.546
22	3 9 8.72	2.0607	14 31 29.4	10.900	22	4 50 36.48	2.1668	21 34 9.1	6.438
23	3 11 12.42	2.0627	N.14 42 21.1	10.824	23	4 52 46.53	2.1688	N.21 40 32.1	6.330
SATURDAY 14.					MONDAY 16.				
0	3 13 16.24	2.0647	N.14 53 8.3	10.748	0	4 54 56.70	2.1704	N.21 46 48.5	6.218
1	3 15 20.19	2.0668	15 3 50.9	10.673	1	4 57 6.98	2.1729	21 52 58.3	6.106
2	3 17 24.26	2.0688	15 14 28.9	10.594	2	4 59 17.37	2.1741	21 59 1.5	5.996
3	3 19 28.45	2.0709	15 25 2.2	10.516	3	5 1 27.87	2.1759	22 4 58.1	5.887
4	3 21 32.77	2.0731	15 35 30.8	10.436	4	5 3 38.48	2.1777	22 10 48.0	5.775
5	3 23 37.22	2.0753	15 45 54.5	10.355	5	5 5 49.19	2.1794	22 16 31.1	5.668
6	3 25 41.80	2.0774	15 56 13.4	10.274	6	5 8 0.00	2.1810	22 22 7.5	5.550
7	3 27 46.51	2.0796	16 6 27.4	10.193	7	5 10 10.91	2.1827	22 27 37.1	5.437
8	3 29 51.35	2.0818	16 16 36.5	10.111	8	5 12 21.92	2.1843	22 32 59.9	5.323
9	3 31 56.33	2.0841	16 26 40.7	10.027	9	5 14 33.02	2.1858	22 38 15.9	5.210
10	3 34 1.44	2.0863	16 36 39.8	9.943	10	5 16 44.22	2.1873	22 43 25.1	5.097
11	3 36 6.68	2.0885	16 46 33.8	9.858	11	5 18 55.50	2.1888	22 48 27.5	4.983
12	3 38 12.06	2.0908	16 56 22.8	9.773	12	5 21 6.87	2.1909	22 53 23.0	4.868
13	3 40 17.58	2.0931	17 6 6.6	9.686	13	5 23 18.32	2.1915	22 58 11.6	4.754
14	3 42 23.23	2.0954	17 15 45.1	9.598	14	5 25 29.85	2.1926	23 2 53.2	4.635
15	3 44 29.02	2.0977	17 25 18.4	9.511	15	5 27 41.46	2.1942	23 7 27.8	4.516
16	3 46 34.95	2.1000	17 34 46.4	9.423	16	5 29 53.15	2.1956	23 11 55.4	4.400
17	3 48 41.02	2.1023	17 44 9.1	9.333	17	5 32 4.92	2.1967	23 16 16.0	4.286
18	3 50 47.22	2.1046	17 53 26.4	9.242	18	5 34 16.76	2.1978	23 20 29.7	4.169
19	3 52 53.57	2.1070	18 2 38.2	9.151	19	5 36 28.66	2.1988	23 24 36.3	4.059
20	3 55 0.06	2.1093	18 11 44.5	9.060	20	5 38 40.62	2.1998	23 28 35.9	3.934
21	3 57 6.60	2.1116	18 20 45.4	8.968	21	5 40 52.64	2.2008	23 32 28.4	3.816
22	3 59 13.45	2.1139	18 29 40.7	8.874	22	5 43 4.72	2.2018	23 36 13.8	3.697
23	4 1 20.35	2.1162	18 38 30.3	8.780	23	5 45 16.86	2.2027	23 39 52.1	3.578
24	4 3 27.39	2.1186	N.18 47 14.3	8.688	24	5 47 29.05	2.2035	N.23 43 23.2	3.459

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 17.					THURSDAY 19.				
0	h m s		N. 23° 43' 23.2"	3.450	0	h m s		N. 24° 11' 14.9"	2.964
1	5 47 29.05	2.9035	23 46 47.2	3.341	1	7 33 3.52	2.1723	24 8 55.6	2.379
2	5 49 41.28	2.9043	23 50 4.1	3.222	2	7 35 13.80	2.1709	24 6 29.4	2.493
3	5 51 53.56	2.9050	23 53 13.8	3.109	3	7 37 23.95	2.1691	24 3 56.4	2.607
4	5 54 5.88	2.9056	23 56 16.3	2.992	4	7 39 33.97	2.1669	24 1 16.6	2.730
5	5 56 18.23	2.9062	23 59 11.7	2.863	5	7 41 43.86	2.1638	23 58 30.0	2.853
6	5 58 30.62	2.9067	24 1 59.9	2.743	6	7 43 53.62	2.1616	23 55 36.6	2.946
7	6 0 43.04	2.9072	24 4 40.9	2.623	7	7 46 3.25	2.1593	23 52 36.5	3.058
8	6 2 55.48	2.9076	24 7 14.7	2.502	8	7 48 12.74	2.1569	23 49 29.7	3.169
9	6 5 7.95	2.9080	24 9 41.2	2.382	9	7 50 22.06	2.1544	23 46 16.2	3.280
10	6 7 20.44	2.9083	24 12 0.5	2.262	10	7 52 31.27	2.1520	23 42 56.1	3.390
11	6 9 32.94	2.9085	24 14 12.6	2.142	11	7 54 40.32	2.1496	23 39 29.4	3.501
12	6 11 45.46	2.9087	24 16 17.5	2.021	12	7 56 49.22	2.1471	23 35 56.0	3.612
13	6 13 57.99	2.9088	24 18 15.1	1.900	13	7 58 57.97	2.1445	23 32 16.0	3.721
14	6 16 10.52	2.9088	24 20 5.5	1.779	14	8 1 6.56	2.1419	23 28 29.5	3.829
15	6 18 23.05	2.9088	24 21 48.6	1.658	15	8 3 15.00	2.1393	23 24 36.6	3.938
16	6 20 35.58	2.9088	24 23 24.5	1.537	16	8 5 23.28	2.1367	23 20 37.2	4.044
17	6 22 48.11	2.9087	24 24 53.1	1.417	17	8 7 31.40	2.1340	23 16 31.3	4.151
18	6 25 0.62	2.9084	24 26 14.6	1.296	18	8 9 39.36	2.1312	23 12 19.0	4.256
19	6 27 13.12	2.9081	24 27 28.6	1.175	19	8 11 47.15	2.1284	23 8 0.3	4.364
20	6 29 25.60	2.9078	24 28 35.5	1.054	20	8 13 54.77	2.1257	23 3 35.3	4.470
21	6 31 38.06	2.9075	24 29 35.1	0.933	21	8 16 2.23	2.1229	22 59 3.9	4.576
22	6 33 50.50	2.9071	24 30 27.5	0.812	22	8 18 9.52	2.1200	22 54 26.2	4.680
23	6 36 2.91	2.9068	N. 24 31 12.7	0.692	23	8 20 16.63	2.1171	N. 22 49 42.3	4.783
24	6 38 15.28	2.9065				8 22 23.57	2.1142		
WEDNESDAY 18.					FRIDAY 20.				
0	6 40 27.62	2.9053	N. 24 31 50.6	0.572	0	8 24 30.34	2.1113	N. 22 44 52.2	4.886
1	6 42 39.92	2.9046	24 32 21.3	0.452	1	8 26 36.93	2.1083	22 39 55.9	4.989
2	6 44 52.17	2.9038	24 32 44.8	0.331	2	8 28 43.24	2.1053	22 34 53.5	5.092
3	6 47 4.38	2.9031	24 33 1.0	0.210	3	8 30 49.57	2.1023	22 29 44.9	5.193
4	6 49 16.54	2.9022	24 33 10.0	+ 0.090	4	8 32 55.62	2.0993	22 24 30.3	5.294
5	6 51 28.64	2.9012	24 33 11.8	- 0.029	5	8 35 1.49	2.0962	22 19 9.6	5.395
6	6 53 40.69	2.9002	24 33 6.5	0.148	6	8 37 7.17	2.0932	22 13 42.9	5.496
7	6 55 52.67	2.1992	24 32 54.0	0.268	7	8 39 12.67	2.0902	22 8 10.2	5.594
8	6 58 4.59	2.1981	24 32 34.3	0.388	8	8 41 17.99	2.0871	22 2 31.6	5.693
9	7 0 16.44	2.1969	24 32 7.4	0.507	9	8 43 23.12	2.0840	21 56 47.1	5.791
10	7 2 28.22	2.1957	24 31 33.4	0.627	10	8 45 28.06	2.0808	21 50 56.7	5.888
11	7 4 39.92	2.1943	24 30 52.2	0.746	11	8 47 32.82	2.0776	21 45 0.5	5.985
12	7 6 51.54	2.1930	24 30 3.9	0.864	12	8 49 37.38	2.0744	21 38 58.5	6.082
13	7 9 3.08	2.1916	24 29 8.5	0.982	13	8 51 41.75	2.0713	21 32 50.7	6.177
14	7 11 14.53	2.1901	24 28 6.0	1.100	14	8 53 45.94	2.0682	21 26 37.2	6.272
15	7 13 25.89	2.1885	24 26 56.5	1.218	15	8 55 49.94	2.0651	21 20 18.1	6.366
16	7 15 37.15	2.1869	24 25 39.9	1.336	16	8 57 53.75	2.0619	21 13 53.3	6.460
17	7 17 48.32	2.1853	24 24 16.2	1.453	17	8 59 57.37	2.0587	21 7 22.9	6.553
18	7 19 59.39	2.1836	24 22 45.5	1.570	18	9 2 0.79	2.0554	21 0 47.0	6.646
19	7 22 10.35	2.1818	24 21 7.8	1.687	19	9 4 4.02	2.0522	20 54 5.5	6.737
20	7 24 21.21	2.1801	24 19 23.1	1.803	20	9 6 7.06	2.0491	20 47 18.5	6.828
21	7 26 31.96	2.1783	24 17 31.4	1.919	21	9 8 9.91	2.0459	20 40 26.1	6.919
22	7 28 42.60	2.1765	24 15 32.8	2.034	22	9 10 12.57	2.0427	20 33 28.2	7.009
23	7 30 53.12	2.1747	24 13 27.3	2.149	23	9 12 15.03	2.0394	20 26 25.0	7.098
24	7 33 3.52	2.1729	N. 24 11 14.9	2.264	24	9 14 17.30	2.0362	N. 20 19 16.4	7.187

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 21.					MONDAY 23.				
0	9 14 17.30	2.0388	N.20 19' 16.4	7.187	0	10 48 39.58	1.9085	N.13 4' 35.1	10.877
1	9 16 19.38	2.0331	20 12 2.5	7.375	1	10 50 38.91	1.9046	12 53 52.8	10.734
2	9 18 21.27	2.0289	20 4 43.4	7.362	2	10 52 28.13	1.9008	12 43 7.1	10.790
3	9 20 22.97	2.0247	19 57 19.1	7.448	3	10 54 22.25	1.9011	12 32 18.0	10.846
4	9 22 24.48	2.0206	19 49 49.6	7.535	4	10 56 16.26	1.8994	12 21 25.6	10.901
5	9 24 25.80	2.0164	19 42 14.9	7.621	5	10 58 10.17	1.8977	12 10 29.9	10.956
6	9 26 26.93	2.0123	19 34 35.1	7.705	6	11 0 3.99	1.8960	11 59 30.9	11.010
7	9 28 27.87	2.0141	19 26 50.3	7.789	7	11 1 57.71	1.8946	11 48 28.7	11.063
8	9 30 28.62	2.0110	19 19 0.4	7.873	8	11 3 51.34	1.8930	11 37 23.4	11.115
9	9 32 29.19	2.0079	19 11 5.5	7.956	9	11 5 44.87	1.8915	11 26 14.9	11.167
10	9 34 29.57	2.0048	19 3 5.7	8.038	10	11 7 38.32	1.8901	11 15 3.3	11.219
11	9 36 29.77	2.0017	18 55 1.0	8.119	11	11 9 31.69	1.8888	11 3 48.6	11.270
12	9 38 29.78	1.9987	18 46 51.4	8.200	12	11 11 24.96	1.8875	10 52 30.9	11.320
13	9 40 29.61	1.9956	18 38 37.0	8.280	13	11 13 18.19	1.8860	10 41 10.2	11.370
14	9 42 29.25	1.9925	18 30 17.8	8.359	14	11 15 11.33	1.8851	10 29 46.5	11.419
15	9 44 28.71	1.9895	18 21 53.9	8.437	15	11 17 4.40	1.8840	10 18 19.9	11.467
16	9 46 27.90	1.9865	18 13 25.3	8.516	16	11 18 57.41	1.8830	10 6 50.4	11.515
17	9 48 27.09	1.9835	18 4 52.0	8.594	17	11 20 50.35	1.8818	9 55 18.1	11.562
18	9 50 26.02	1.9807	17 56 14.0	8.672	18	11 22 43.23	1.8809	9 43 43.0	11.608
19	9 52 24.77	1.9777	17 47 31.4	8.750	19	11 24 36.06	1.8800	9 32 5.1	11.654
20	9 54 23.34	1.9748	17 38 44.3	8.828	20	11 26 28.83	1.8791	9 20 24.5	11.700
21	9 56 21.74	1.9719	17 29 52.7	8.906	21	11 28 21.55	1.8783	9 8 41.1	11.745
22	9 58 19.97	1.9691	17 20 56.6	8.979	22	11 30 14.23	1.8776	8 56 55.1	11.789
23	10 0 18.03	1.9663	N.17 11 56.1	9.045	23	11 32 6.86	1.8769	N. 8 45 6.5	11.833
SUNDAY 22					TUESDAY 24.				
0	10 2 15.91	1.9633	N.17 2 51.2	9.116	0	11 33 59.45	1.8763	N. 8 33 15.3	11.875
1	10 4 13.62	1.9605	16 53 41.9	9.191	1	11 35 52.01	1.8758	8 21 21.5	11.917
2	10 6 11.17	1.9578	16 44 28.3	9.266	2	11 37 44.54	1.8753	8 9 25.2	11.958
3	10 8 8.56	1.9550	16 35 10.5	9.333	3	11 39 37.04	1.8748	7 57 26.5	11.999
4	10 10 5.79	1.9523	16 25 48.4	9.403	4	11 41 29.51	1.8744	7 45 25.3	12.040
5	10 12 2.86	1.9496	16 16 22.1	9.473	5	11 43 21.97	1.8741	7 33 21.7	12.080
6	10 13 59.77	1.9470	16 6 51.6	9.542	6	11 45 14.41	1.8738	7 21 15.7	12.119
7	10 15 56.52	1.9444	15 57 17.0	9.611	7	11 47 6.83	1.8737	7 9 7.4	12.157
8	10 17 53.12	1.9418	15 47 38.3	9.678	8	11 48 59.25	1.8736	6 56 56.8	12.195
9	10 19 49.57	1.9393	15 37 55.6	9.745	9	11 50 51.68	1.8735	6 44 44.0	12.232
10	10 21 45.87	1.9371	15 28 8.9	9.812	10	11 52 44.07	1.8735	6 32 29.0	12.268
11	10 23 42.02	1.9346	15 18 18.2	9.877	11	11 54 36.48	1.8735	6 20 11.8	12.305
12	10 25 38.02	1.9322	15 8 23.6	9.942	12	11 56 28.89	1.8736	6 7 52.4	12.341
13	10 27 33.88	1.9298	14 58 25.1	10.007	13	11 58 21.31	1.8736	5 55 30.9	12.375
14	10 29 29.60	1.9275	14 48 22.7	10.072	14	12 0 13.75	1.8742	5 43 7.4	12.408
15	10 31 25.18	1.9253	14 38 16.5	10.135	15	12 2 6.21	1.8745	5 30 41.9	12.441
16	10 33 20.63	1.9230	14 28 6.5	10.197	16	12 3 58.69	1.8748	5 18 14.4	12.474
17	10 35 15.94	1.9208	14 17 52.8	10.259	17	12 5 51.19	1.8752	5 5 45.0	12.507
18	10 37 11.12	1.9186	14 7 35.4	10.321	18	12 7 43.72	1.8758	4 53 13.6	12.538
19	10 39 6.17	1.9164	13 57 14.3	10.382	19	12 9 36.29	1.8764	4 40 40.4	12.568
20	10 41 1.09	1.9143	13 46 49.6	10.442	20	12 11 28.89	1.8770	4 28 5.4	12.598
21	10 42 55.89	1.9123	13 36 21.3	10.502	21	12 13 21.53	1.8778	4 15 28.6	12.628
22	10 44 50.57	1.9103	13 25 49.4	10.561	22	12 15 14.22	1.8786	4 2 50.0	12.658
23	10 46 45.13	1.9084	13 15 14.0	10.619	23	12 17 6.96	1.8794	3 50 9.6	12.687
24	10 48 39.58	1.9065	N.13 4 35.1	10.677	24	12 18 59.75	1.8803	N. 3 37 27.6	12.714

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 25.					FRIDAY 27.				
0	12 18 59.75	1.8803	N. 3 37' 27.6"	12.714	0	13 51 42.90	2.0191	S. 6 50' 13.3"	13.118
1	12 20 52.60	1.8813	3 24 44.0	12.740	1	13 53 43.76	2.0168	7 3 20.0	13.105
2	12 22 45.51	1.8824	3 11 58.8	12.766	2	13 55 44.91	2.0215	7 16 25.9	13.080
3	12 24 38.49	1.8836	2 59 12.1	12.791	3	13 57 46.34	2.0248	7 29 30.8	13.074
4	12 26 31.54	1.8848	2 46 23.9	12.816	4	13 59 48.06	2.0311	7 42 34.7	13.057
5	12 28 24.67	1.8861	2 33 34.2	12.840	5	14 1 50.07	2.0360	7 55 37.6	13.038
6	12 30 17.88	1.8875	2 20 43.1	12.863	6	14 3 52.38	2.0411	8 8 39.3	13.018
7	12 32 11.17	1.8888	2 7 50.6	12.886	7	14 5 55.00	2.0460	8 21 39.8	12.997
8	12 34 4.54	1.8902	1 54 56.8	12.908	8	14 7 57.93	2.0514	8 34 39.0	12.975
9	12 35 58.00	1.8918	1 42 1.7	12.929	9	14 10 1.17	2.0566	8 47 36.8	12.952
10	12 37 51.56	1.8935	1 29 5.3	12.949	10	14 12 4.72	2.0618	9 0 33.2	12.928
11	12 39 45.22	1.8953	1 16 7.8	12.968	11	14 14 8.59	2.0672	9 13 28.2	12.904
12	12 41 38.99	1.8971	1 3 9.1	12.987	12	14 16 12.79	2.0727	9 26 21.7	12.877
13	12 43 32.87	1.8989	0 50 9.3	13.006	13	14 18 17.32	2.0783	9 39 13.5	12.848
14	12 45 26.86	1.9008	0 37 8.4	13.024	14	14 20 22.19	2.0840	9 52 3.5	12.818
15	12 47 20.97	1.9029	0 24 6.4	13.041	15	14 22 27.40	2.0897	10 4 51.7	12.788
16	12 49 15.21	1.9050	N. 0 11 3.5	13.057	16	14 24 32.95	2.0954	10 17 38.1	12.757
17	12 51 9.57	1.9071	S. 0 2 0.4	13.072	17	14 26 38.85	2.1012	10 30 22.5	12.723
18	12 53 4.06	1.9093	0 15 5.2	13.087	18	14 28 45.10	2.1072	10 43 4.9	12.689
19	12 54 58.68	1.9116	0 28 10.8	13.100	19	14 30 51.71	2.1132	10 55 45.2	12.654
20	12 56 53.45	1.9141	0 41 17.2	13.112	20	14 32 58.68	2.1192	11 8 23.3	12.617
21	12 58 48.37	1.9166	0 54 24.3	13.124	21	14 35 6.02	2.1254	11 20 59.2	12.578
22	13 0 43.44	1.9191	1 7 32.1	13.136	22	14 37 13.73	2.1316	11 33 32.7	12.538
23	13 2 38.66	1.9217	S. 1 20 40.6	13.147	23	14 39 21.81	2.1378	S. 11 46 3.8	12.497
THURSDAY 26.					SATURDAY 28.				
0	13 4 34.04	1.9244	S. 1 33 49.8	13.157	0	14 41 30.27	2.1448	S. 11 58 32.4	12.455
1	13 6 29.59	1.9271	1 46 59.5	13.166	1	14 43 39.11	2.1506	12 10 58.4	12.411
2	13 8 25.30	1.9299	2 0 9.7	13.173	2	14 45 48.34	2.1571	12 23 21.7	12.365
3	13 10 21.18	1.9328	2 13 20.3	13.180	3	14 47 57.96	2.1636	12 35 42.2	12.318
4	13 12 17.24	1.9359	2 26 31.3	13.187	4	14 50 7.97	2.1702	12 47 59.9	12.270
5	13 14 13.49	1.9390	2 39 42.7	13.192	5	14 52 18.38	2.1768	13 0 14.6	12.220
6	13 16 9.92	1.9421	2 52 54.4	13.197	6	14 54 29.19	2.1836	13 12 26.3	12.169
7	13 18 6.54	1.9453	3 6 6.3	13.200	7	14 56 40.41	2.1904	13 24 34.9	12.117
8	13 20 3.36	1.9486	3 19 18.4	13.203	8	14 58 52.04	2.1972	13 36 40.3	12.062
9	13 22 0.38	1.9520	3 32 30.7	13.205	9	15 1 4.08	2.2041	13 48 42.3	12.005
10	13 23 57.60	1.9554	3 45 43.0	13.206	10	15 3 16.53	2.2110	14 0 40.9	11.947
11	13 25 55.03	1.9590	3 58 55.4	13.207	11	15 5 29.40	2.2180	14 12 36.0	11.889
12	13 27 52.68	1.9627	4 12 7.8	13.206	12	15 7 42.69	2.2251	14 24 27.6	11.829
13	13 29 50.55	1.9664	4 25 20.1	13.204	13	15 9 56.41	2.2322	14 36 15.5	11.767
14	13 31 48.64	1.9701	4 38 32.3	13.201	14	15 12 10.56	2.2394	14 47 59.6	11.703
15	13 33 46.96	1.9740	4 51 44.2	13.197	15	15 14 25.14	2.2467	14 59 39.8	11.638
16	13 35 45.52	1.9779	5 4 55.9	13.192	16	15 16 40.16	2.2540	15 11 16.1	11.571
17	13 37 44.31	1.9818	5 18 7.3	13.187	17	15 18 55.62	2.2613	15 22 48.3	11.503
18	13 39 43.34	1.9859	5 31 18.3	13.180	18	15 21 11.51	2.2686	15 34 16.3	11.433
19	13 41 42.62	1.9901	5 44 28.9	13.172	19	15 23 27.85	2.2761	15 45 40.1	11.360
20	13 43 42.15	1.9943	5 57 39.0	13.164	20	15 25 44.64	2.2836	15 56 59.5	11.286
21	13 45 41.94	1.9987	6 10 48.6	13.155	21	15 28 1.87	2.2909	16 8 14.4	11.210
22	13 47 41.99	2.0031	6 23 57.6	13.143	22	15 30 19.55	2.2985	16 19 24.7	11.133
23	13 49 42.31	2.0076	6 37 5.8	13.131	23	15 32 37.69	2.3061	16 30 30.4	11.056
24	13 51 42.90	2.0121	S. 6 50 13.3	13.118	24	15 34 56.28	2.3137	S. 16 41 31.3	10.974

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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SUNDAY 29

0	15 ^h 34 ^m 56.28 ^s	2.3137	8.16° 41' 31.3"	10.974
1	15 37 15.33	2.3013	16 52 27.3	10.808
2	15 39 34.84	2.3000	17 3 18.3	10.808
3	15 41 54.81	2.3067	17 14 4.3	10.783
4	15 44 15.24	2.3444	17 24 45.1	10.635
5	15 46 36.14	2.3692	17 35 20.5	10.545
6	15 48 57.50	2.3600	17 45 50.5	10.454
7	15 51 19.33	2.3677	17 56 15.0	10.368
8	15 53 41.62	2.3754	18 6 33.9	10.267
9	15 56 4.38	2.3833	18 16 47.1	10.171
10	15 58 27.61	2.3911	18 26 54.4	10.079
11	16 0 51.31	2.3989	18 36 55.8	9.978
12	16 3 15.48	2.4067	18 46 51.1	9.870
13	16 5 40.12	2.4148	18 56 40.2	9.767
14	16 8 5.23	2.4224	19 6 23.1	9.660
15	16 10 30.81	2.4303	19 15 59.6	9.554
16	16 12 56.86	2.4381	19 25 29.6	9.445
17	16 15 23.38	2.4458	19 34 53.0	9.333
18	16 17 50.36	2.4536	19 44 9.6	9.220
19	16 20 17.81	2.4614	19 53 19.4	9.106
20	16 22 45.73	2.4692	20 2 22.3	8.989
21	16 25 14.12	2.4770	20 11 18.1	8.871
22	16 27 42.97	2.4847	20 20 6.8	8.751
23	16 30 12.28	2.4923	8.20 28 48.2	8.628

TUESDAY, JULY 1.

0	17 ^h 34 ^m 45.82 ^s	2.5000	8.23° 21' 28.5"	5.000
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PHASES OF THE MOON.

○ Full Moon . . .	June	d	h	m
☾ Last Quarter . . .		9	9	49.9
● New Moon . . .		16	21	57.7
☾ First Quarter . . .		25	1	53.6

☾ Perigee . . .	June	d	h
☾ Apogee . . .		20	15.5

MONDAY 30.

0	16 32 42.05	2.5000	8.20 37 22.2	8.504
1	16 35 12.28	2.5076	20 45 48.7	8.376
2	16 37 42.96	2.5152	20 54 7.6	8.251
3	16 40 14.10	2.5227	21 2 18.9	8.128
4	16 42 45.69	2.5302	21 10 22.3	7.991
5	16 45 17.72	2.5376	21 18 17.8	7.858
6	16 47 50.20	2.5450	21 26 5.3	7.723
7	16 50 23.12	2.5523	21 33 44.6	7.587
8	16 52 56.47	2.5595	21 41 15.7	7.448
9	16 55 30.26	2.5667	21 48 38.4	7.307
10	16 58 4.48	2.5738	21 55 52.6	7.166
11	17 0 39.12	2.5809	22 2 58.3	7.023
12	17 3 14.19	2.5879	22 9 55.4	6.878
13	17 5 49.67	2.5948	22 16 43.7	6.731
14	17 8 25.56	2.6016	22 23 23.1	6.582
15	17 11 1.86	2.6083	22 29 53.6	6.432
16	17 13 38.56	2.6149	22 36 15.0	6.280
17	17 16 15.65	2.6214	22 42 27.2	6.127
18	17 18 53.13	2.6278	22 48 30.2	5.973
19	17 21 30.99	2.6342	22 54 23.8	5.815
20	17 24 9.23	2.6404	2 0 8.0	5.657
21	17 26 47.84	2.6465	23 5 42.7	5.497
22	17 29 26.81	2.6525	23 11 7.7	5.336
23	17 32 6.14	2.6584	23 16 23.0	5.173
24	17 34 45.82	2.6642	8.23 21 28.5	5.000

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	SATURN W.	79° 16' 9"	9370	81° 0' 27"	9355	82° 45' 6"	9341	84° 30' 7"	9326
	Regulus W.	79 1 53	9359	80 46 26	9343	82 31 23	9336	84 16 41	9314
	Spica W.	25 33 6	9499	27 14 20	9469	28 56 19	9440	30 38 57	9413
	α Aquilæ E.	73 33 32	9163	72 6 38	9164	70 39 46	9167	69 12 58	9173
	JUPITER E.	84 51 50	9352	83 7 6	9336	81 22 1	9321	79 36 33	9307
2	SATURN W.	93 20 15	9259	95 7 14	9247	96 54 30	9236	98 42 4	9225
	Regulus W.	93 8 17	9248	94 55 33	9236	96 43 7	9225	98 30 58	9214
	Spica W.	39 20 49	9307	41 6 38	9290	42 52 52	9274	44 39 29	9259
	α Aquilæ E.	62 1 46	9346	60 36 31	9369	59 11 44	9399	57 47 31	9339
	JUPITER E.	70 44 11	9241	68 56 45	9229	67 9 2	9218	65 21 1	9207
	Fomalhaut E.	91 31 30	9411	89 48 12	9399	88 4 36	9388	86 20 45	9378
3	Regulus W.	107 34 2	9168	109 23 18	9161	111 12 46	9154	113 2 23	9147
	Spica W.	53 37 37	9198	55 26 7	9189	57 14 51	9180	59 3 48	9173
	α Aquilæ E.	50 58 6	9587	49 39 18	9602	48 21 51	9747	47 5 54	9840
	JUPITER E.	56 17 12	9161	54 27 46	9154	52 38 10	9148	50 48 24	9149
	Fomalhaut E.	77 38 12	9240	75 53 11	9236	74 8 3	9239	72 22 50	9230
	α Pegasi E.	95 29 10	9573	93 49 38	9565	92 9 53	9557	90 29 57	9550
4	Spica W.	68 11 17	9143	70 1 11	9139	71 51 11	9135	73 41 16	9133
	JUPITER E.	41 37 33	9121	39 47 7	9119	37 56 39	9118	36 6 8	9119
	Fomalhaut E.	63 36 20	9233	61 51 9	9238	60 6 5	9245	58 21 12	9253
	α Pegasi E.	82 8 33	9235	80 28 9	9237	78 47 47	9240	77 7 30	9245
5	Spica W.	82 52 16	9131	84 42 27	9139	86 32 37	9135	88 22 43	9137
	MARS W.	41 47 21	9028	43 40 11	9028	45 33 0	9029	47 25 48	9031
	Antares W.	37 2 17	9163	38 51 39	9160	40 41 6	9158	42 30 36	9158
	Fomalhaut E.	49 40 28	9421	47 57 24	9442	46 14 50	9466	44 32 50	9494
	α Pegasi E.	68 48 27	9593	67 9 24	9609	65 30 41	9626	63 52 22	9645
	α Arietis E.	110 53 37	9246	109 6 19	9245	107 18 59	9244	105 31 38	9244
6	Spica W.	97 31 56	9159	99 21 25	9165	101 10 45	9171	102 59 56	9178
	MARS W.	56 48 43	9050	58 40 59	9055	60 33 7	9061	62 25 7	9067
	Antares W.	51 37 58	9166	53 27 16	9170	55 16 28	9175	57 5 34	9180
	α Pegasi E.	55 48 27	9783	54 13 37	9819	52 39 34	9859	51 6 23	9905
	α Arietis E.	96 35 23	9256	94 48 22	9263	93 1 29	9269	91 14 44	9275
7	MARS W.	71 42 26	9104	73 33 19	9112	75 23 58	9121	77 14 24	9130
	Antares W.	66 8 49	9213	67 56 57	9221	69 44 53	9229	71 32 37	9237
	α Arietis E.	82 23 38	9217	80 38 2	9236	78 52 42	9236	77 7 36	9248
	SUN E.	121 56 55	9481	120 15 15	9490	118 33 48	9499	116 52 34	9509
8	MARS W.	86 22 55	9181	88 11 51	9191	90 0 31	9202	91 48 56	9213
	Antares W.	80 27 53	9286	82 14 13	9296	84 0 18	9306	85 46 7	9317
	α Aquilæ W.	43 53 48	9462	45 2 50	9466	46 13 34	9469	47 25 53	9477
	α Arietis E.	68 26 29	9412	66 43 12	9427	65 0 16	9442	63 17 42	9458
	SUN E.	108 29 56	9563	106 50 9	9574	105 10 38	9585	103 31 22	9597
9	MARS W.	100 46 50	9269	102 33 34	9280	104 20 1	9292	106 6 11	9304
	Antares W.	94 31 19	9373	96 15 32	9384	97 59 29	9395	99 43 10	9406
	JUPITER W.	31 28 11	9366	33 12 34	9375	34 56 45	9384	36 40 44	9393

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dist.	XVh	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	SATURN	W.	86 15 28	9311	86 1 11	9297	89 47 13	9264	91 33 34	9271
	Regulus	W.	86 2 20	9300	87 48 19	9287	89 34 39	9274	91 21 18	9261
	Spica	W.	32 22 14	9387	34 6 7	9385	35 50 32	9345	37 35 26	9325
	α Aquilæ	E.	67 46 17	9181	66 19 46	9192	64 53 28	9207	63 27 27	9224
	JUPITER	E.	77 50 45	9293	76 4 36	9279	74 18 7	9266	72 31 19	9253
2	SATURN	W.	100 29 53	9215	102 17 58	9205	104 6 18	9196	105 54 52	9187
	Regulus	W.	100 19 6	9203	102 7 29	9194	103 56 6	9185	105 44 58	9176
	Spica	W.	46 26 28	9246	48 13 48	9233	50 1 27	9221	51 49 23	9209
	α Aquilæ	E.	56 23 56	9371	55 1 7	9415	53 39 7	9466	52 18 5	9522
	JUPITER	E.	63 32 45	9197	61 44 13	9187	59 55 26	9178	58 6 25	9169
	Fomalhaut	E.	84 36 39	9369	82 52 20	9360	81 7 48	9359	79 23 5	9345
3	Regulus	W.	114 52 11	9141	116 42 7	9137	118 32 10	9133	120 22 20	9139
	Spica	W.	60 52 58	9165	62 42 18	9158	64 31 49	9152	66 21 29	9147
	α Aquilæ	E.	45 51 31	9246	44 38 58	9269	43 28 28	9294	42 20 6	9327
	JUPITER	E.	48 58 28	9136	47 8 24	9131	45 18 12	9127	43 27 55	9124
	Fomalhaut	E.	70 37 33	9328	68 52 14	9327	67 6 54	9326	65 21 36	9330
	α Pegasi	E.	88 49 51	9543	87 9 38	9540	85 20 19	9537	83 48 57	9536
4	Spica	W.	75 31 25	9131	77 21 36	9130	79 11 49	9130	81 2 2	9129
	JUPITER	E.	34 15 38	9190	32 25 10	9192	30 34 45	9195	28 44 24	9198
	Fomalhaut	E.	56 36 30	9363	54 52 1	9375	53 7 50	9398	51 23 58	9403
	α Pegasi	E.	75 27 19	9552	73 47 18	9559	72 7 27	9560	70 27 49	9560
5	Spica	W.	90 12 45	9140	92 2 43	9143	93 52 34	9148	95 42 19	9153
	MARS	W.	49 18 32	9234	51 11 13	9237	53 3 49	9241	54 56 19	9245
	Antares	W.	44 20 7	9158	46 9 38	9158	47 59 8	9160	49 48 35	9163
	Fomalhaut	E.	42 51 29	9594	41 10 50	9561	39 31 2	9501	37 52 8	9547
	α Pegasi	E.	62 14 29	9268	60 37 6	9292	59 0 16	9279	57 24 1	9249
	α Arietis	E.	103 44 17	9246	101 56 58	9248	100 9 42	9250	98 22 29	9254
6	Spica	W.	104 48 55	9186	106 37 44	9194	108 26 20	9202	110 14 44	9211
	MARS	W.	64 16 56	9273	66 8 36	9280	68 0 4	9288	69 51 21	9296
	Antares	W.	58 54 31	9186	60 43 21	9192	62 32 0	9196	64 20 30	9205
	α Pegasi	E.	49 34 11	9264	48 3 1	9268	46 32 59	9269	45 4 12	9277
	α Arietis	E.	89 28 8	9262	87 41 43	9260	85 55 29	9266	84 9 27	9267
7	MARS	W.	79 4 35	9140	80 54 33	9150	82 44 15	9160	84 33 43	9170
	Antares	W.	73 20 7	9246	75 7 25	9255	76 54 28	9265	78 41 18	9275
	α Arietis	E.	75 22 47	9260	73 38 15	9272	71 54 1	9285	70 10 5	9298
	SUN	E.	115 11 33	9519	113 30 47	9530	111 50 15	9541	110 9 58	9552
8	MARS	W.	93 37 4	9224	95 24 56	9235	97 12 31	9246	98 59 49	9257
	Antares	W.	87 31 41	9298	89 17 0	9309	91 2 2	9320	92 46 48	9331
	α Aquilæ	W.	48 39 36	9392	49 54 36	9403	51 10 44	9417	52 27 55	9428
	α Arietis	E.	61 35 30	9474	59 53 41	9491	58 12 16	9510	56 31 17	9529
	SUN	E.	101 52 22	9606	100 13 38	9619	98 35 10	9630	96 56 58	9642
9	MARS	W.	107 52 4	9216	109 37 40	9226	111 22 59	9240	113 8 0	9252
	Antares	W.	101 26 34	9418	103 9 42	9430	104 52 33	9442	106 35 7	9453
	JUPITER	W.	38 24 29	9403	40 7 59	9413	41 51 16	9423	43 34 18	9433

GREENWICH MEAN TIME.

* LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	α Aquilæ W.	53 46 1	3580	55 4 57	3538	56 24 38	3504	57 44 58	3471
	α Arietis E.	54 50 43	3548	53 10 37	3569	51 30 59	3590	49 51 51	3613
	SUN E.	95 19 2	3655	93 41 22	3667	92 3 59	3679	90 26 52	3691
10	α Aquilæ W.	64 34 10	3365	65 57 6	3352	67 20 18	3341	68 43 42	3339
	JUPITER W.	45 17 6	3443	46 59 39	3453	48 41 57	3463	50 24 1	3473
	α Arietis E.	41 44 32	3752	40 9 1	3786	38 34 13	3832	37 0 14	3882
	SUN E.	82 25 20	3759	80 49 50	3764	79 14 36	3776	77 39 38	3788
11	α Aquilæ W.	75 42 39	3311	77 6 37	3312	78 30 34	3314	79 54 30	3317
	JUPITER W.	58 50 42	3527	60 31 18	3537	62 11 41	3547	63 51 49	3557
	Fomalhaut W.	40 32 48	3955	42 3 57	3938	43 35 25	3924	45 7 13	3914
	SUN E.	69 48 40	3647	68 15 14	3659	66 42 3	3671	65 9 7	3682
12	α Aquilæ W.	86 52 56	3345	88 16 15	3364	89 39 24	3383	91 2 22	3375
	JUPITER W.	72 9 2	3606	73 47 48	3616	75 26 21	3625	77 4 40	3635
	Fomalhaut W.	52 48 37	3990	54 21 9	3988	55 53 43	3988	57 26 17	3989
	α Pegasi W.	39 39 19	3785	40 54 37	3730	42 11 3	3661	43 28 31	3610
	SUN E.	57 28 2	3937	55 56 31	3948	54 25 13	3959	52 54 9	3970
13	α Aquilæ W.	97 53 48	3441	99 15 18	3457	100 36 29	3475	101 57 21	3494
	JUPITER W.	85 13 7	3683	86 50 10	3692	88 27 2	3701	90 3 41	3710
	Fomalhaut W.	65 8 36	3901	66 40 53	3906	68 13 4	3911	69 45 9	3916
	α Pegasi W.	50 7 40	3435	51 29 17	3411	52 51 21	3391	54 13 48	3372
	SUN E.	45 22 6	3691	43 52 20	3631	42 22 46	3641	40 53 25	3651
14	JUPITER W.	98 4 2	3753	99 39 31	3769	101 14 50	3771	102 49 57	3779
	Fomalhaut W.	77 23 52	3945	78 55 14	3951	80 26 27	3958	81 57 32	3965
	α Pegasi W.	61 10 25	3314	62 34 22	3306	63 58 26	3301	65 22 38	3296
	SUN E.	33 29 36	3699	32 1 25	3109	30 33 25	3118	29 5 37	3127
18	SUN W.	12 8 8	3356	13 31 14	3362	14 54 13	3369	16 17 5	3374
	Regulus E.	49 6 15	3691	47 36 28	3627	46 6 49	3693	44 37 19	3640
	SATURN E.	49 57 16	3639	48 27 52	3646	46 58 37	3653	45 29 29	3659
	Spica E.	103 9 10	3630	101 39 35	3635	100 10 6	3640	98 40 43	3645
19	SUN W.	23 9 50	3401	24 32 5	3406	25 54 15	3410	27 16 21	3415
	Regulus E.	37 11 54	3675	35 43 14	3682	34 14 42	3689	32 46 19	3696
	SATURN E.	38 5 43	3689	36 37 20	3695	35 9 3	3101	33 40 53	3106
	Spica E.	91 15 24	3670	89 46 38	3675	88 17 56	3679	86 49 20	3683
20	SUN W.	34 5 40	3439	35 27 20	3434	36 48 58	3436	38 10 34	3438
	Spica E.	79 27 26	3699	77 59 16	3102	76 31 8	3104	75 3 3	3106
	MARS E.	116 26 58	3618	114 57 8	3621	113 27 22	3623	111 57 38	3626
	Antares E.	125 21 44	3103	123 53 38	3104	122 25 34	3105	120 57 31	3106
21	SUN W.	44 58 5	3443	46 19 33	3443	47 41 1	3442	49 2 30	3441
	Spica E.	67 43 15	3113	66 15 22	3114	64 47 30	3115	63 19 39	3115
	MARS E.	104 29 30	3631	102 59 56	3632	101 30 23	3632	100 0 50	3631
	Antares E.	113 37 23	3106	112 9 21	3105	110 41 19	3104	109 13 15	3104
22	SUN W.	55 50 17	3431	57 11 58	3427	58 33 43	3423	59 55 33	3419

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV ^h .	P. L. of Diff.	XVIII ^h .	P. L. of Diff.	XXI ^h .	P. L. of Diff.
9	α Aquilæ	W.	59 5 54	3444	60 27 21	3490	61 49 14	3399	63 11 31	3380
	α Arietis	E.	48 13 14	9637	46 35 9	9663	44 57 40	9649	43 20 46	9719
	SUN	E.	88 50 1	9704	87 13 27	9716	85 37 8	9798	84 1 6	9740
10	α Aquilæ	W.	70 7 16	3394	71 30 59	3318	72 54 49	3315	74 18 42	3319
	JUPITER	W.	52 5 50	9484	53 47 25	9484	55 28 45	9505	57 9 50	9516
	α Arietis	E.	35 27 7	9908	33 54 59	9958	32 23 54	3013	30 53 58	3077
	SUN	E.	76 4 56	9800	74 30 29	9812	72 56 17	9894	71 22 21	9836
11	α Aquilæ	W.	81 18 22	3390	82 42 10	3394	84 5 53	3330	85 29 29	3337
	JUPITER	W.	65 31 43	9586	67 11 24	9576	68 50 50	9588	70 30 3	9597
	Fomalhaut	W.	46 39 14	9907	48 11 24	9900	49 43 43	9895	51 16 8	9899
	SUN	E.	63 36 25	9893	62 3 58	9904	60 31 45	9915	58 59 46	9996
12	α Aquilæ	W.	92 25 7	3387	93 47 40	3399	95 9 58	3419	96 32 1	3496
	JUPITER	W.	78 42 47	9645	80 20 41	9655	81 58 22	9655	83 35 51	9674
	Fomalhaut	W.	58 58 50	9990	60 31 21	9992	62 3 50	9995	63 36 15	9997
	α Pegasi	W.	44 46 54	3566	46 6 5	3598	47 26 0	3499	48 46 33	3461
	SUN	E.	51 23 19	9990	49 52 41	9991	48 22 17	3001	46 52 5	3011
13	α Aquilæ	W.	103 17 52	3513	104 38 2	3534	105 57 50	3555	107 17 13	3578
	JUPITER	W.	91 40 9	9718	93 16 24	9737	94 52 28	9736	96 28 21	9745
	Fomalhaut	W.	71 17 8	9921	72 49 0	9927	74 20 45	9933	75 52 22	9939
	α Pegasi	W.	55 36 36	3556	56 59 42	3543	58 23 4	3539	59 46 39	3592
	SUN	E.	39 24 15	3061	37 55 18	3071	36 26 32	3081	34 57 58	3090
14	JUPITER	W.	104 24 53	9787	105 59 38	9795	107 34 12	9803	109 8 36	9811
	Fomalhaut	W.	83 28 27	9979	84 59 14	9980	86 29 51	9988	88 0 19	9996
	α Pegasi	W.	66 46 54	3593	68 11 15	3590	69 35 38	3588	71 0 4	3597
	SUN	E.	27 36 0	3136	26 10 34	3145	24 43 19	3154	23 16 14	3163
18	SUN	W.	17 39 51	3380	19 2 30	3385	20 25 2	3390	21 47 29	3396
	Regulus	E.	43 7 58	3047	41 38 44	3054	40 9 39	3061	38 40 42	3068
	SATURN	E.	44 0 29	3085	42 31 37	3071	41 2 52	3077	39 34 14	3083
	Spica	E.	97 11 28	3050	95 42 18	3055	94 13 14	3060	92 44 16	3065
19	SUN	W.	28 38 21	3419	30 0 16	3423	31 22 8	3426	32 43 56	3429
	Regulus	E.	31 18 4	3104	29 50 0	3119	28 22 5	3190	26 54 20	3196
	SATURN	E.	32 12 51	3111	30 44 55	3117	29 17 7	3193	27 49 25	3199
	Spica	E.	85 20 49	3067	83 52 22	3090	82 23 59	3093	80 55 41	3096
20	SUN	W.	39 32 7	3440	40 53 38	3441	42 15 8	3449	43 3 37	3443
	Spica	E.	73 35 2	3108	72 7 2	3110	70 39 5	3111	69 11 9	3119
	MARS	E.	110 27 56	3097	108 58 17	3099	107 28 40	3030	105 59 4	3031
	Antares	E.	119 29 28	3107	118 1 27	3107	116 33 26	3107	115 5 25	3106
21	SUN	W.	50 23 59	3440	51 45 30	3438	53 7 3	3436	54 28 39	3434
	Spica	E.	61 51 48	3114	60 23 56	3114	58 56 4	3113	57 28 11	3113
	MARS	E.	98 31 16	3031	97 1 42	3099	95 32 6	3098	94 2 29	3097
	Antares	E.	107 45 10	3109	106 17 3	3100	104 48 53	3098	103 20 41	3095
22	SUN	W.	61 17 27	3415	62 39 26	3410	64 1 31	3404	65 23 43	3398

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Spica E.	56 0 17	3112	54 32 22	3110	53 4 25	3108	51 36 26	3106
	Mars E.	92 32 50	3096	91 3 8	3093	89 33 23	3090	88 3 35	3016
	Antares E.	101 52 25	3092	100 24 6	3089	98 55 43	3085	97 27 15	3081
23	Sun W.	66 46 1	3391	68 8 27	3384	68 31 1	3377	70 53 43	3369
	Spica E.	44 15 51	3095	42 47 35	3093	41 19 16	3090	39 50 53	3087
	Mars E.	80 33 26	2995	79 3 7	2990	77 32 42	2984	76 2 9	2978
	Antares E.	90 3 33	3055	88 34 29	3048	87 5 16	3041	85 35 56	3034
24	Sun W.	77 49 40	3393	79 13 25	3319	80 37 22	3301	82 1 32	3391
	Regulus W.	22 49 12	3045	24 18 29	3027	25 48 8	3010	27 18 8	2992
	Mars E.	68 27 16	2940	66 55 48	2931	65 24 9	2922	63 52 19	2913
	Antares E.	78 6 49	2992	76 36 27	2983	75 5 53	2973	73 35 7	2963
25	Sun W.	89 5 57	3324	90 31 37	3309	91 57 34	3195	93 23 48	3189
	Regulus W.	34 53 14	2913	36 25 16	2898	37 57 38	2892	39 30 20	2886
	Saturn W.	33 17 17	2970	34 48 57	2915	36 20 55	2900	37 53 13	2885
	Mars E.	56 10 0	2961	54 36 51	2850	53 3 27	2839	51 29 49	2827
	Antares E.	65 57 52	2905	64 25 40	2893	62 53 13	2880	61 20 30	2867
	α Aquilæ E.	110 44 6	3729	109 27 50	3699	108 11 4	3671	106 53 46	3644
26	Sun W.	100 39 40	3099	102 7 50	3092	103 36 22	3065	105 5 15	3047
	Regulus W.	47 19 2	2784	48 53 51	2767	50 29 3	2750	52 4 38	2738
	Saturn W.	45 39 45	2805	47 14 6	2782	48 48 49	2770	50 23 54	2754
	Mars E.	43 37 40	2763	42 2 24	2751	40 26 52	2739	38 51 4	2736
	Antares E.	53 32 32	2798	51 58 2	2784	50 23 14	2769	48 48 6	2754
	α Aquilæ E.	100 20 14	3519	99 0 11	3497	97 39 42	3475	96 18 50	3454
27	Sun W.	112 35 19	2953	114 6 31	2934	115 38 7	2914	117 10 8	2894
	Regulus W.	60 8 26	2641	61 46 25	2623	63 24 49	2605	65 3 37	2586
	Saturn W.	58 25 8	2665	60 2 35	2647	61 40 27	2629	63 18 44	2610
	Antares E.	40 47 38	2683	39 10 35	2670	37 33 14	2657	35 55 34	2644
	α Aquilæ E.	89 28 44	3357	88 5 39	3341	86 42 16	3325	85 18 34	3311
	Jupiter E.	102 37 14	2605	100 58 26	2586	99 19 13	2568	97 39 35	2550
28	Regulus W.	73 24 11	2491	75 5 36	2472	76 47 27	2453	78 29 46	2435
	Saturn W.	71 36 32	2516	73 17 24	2497	74 58 42	2478	76 40 27	2459
	Spica W.	20 10 11	2717	21 46 28	2668	23 23 50	2626	25 2 11	2584
	α Aquilæ E.	78 16 12	3253	76 51 6	3246	75 25 50	3239	74 0 27	3234
	Jupiter E.	89 15 3	2457	87 32 50	2438	85 50 11	2420	84 7 5	2402
29	Regulus W.	87 7 56	2343	88 52 52	2325	90 38 15	2308	92 24 2	2291
	Spica W.	33 26 30	2426	35 9 28	2400	36 53 3	2375	38 37 13	2359
	α Aquilæ E.	66 52 53	3240	65 27 31	3249	64 2 19	3259	62 37 20	3274
	Jupiter E.	75 25 1	2311	73 39 18	2293	71 53 9	2276	70 6 34	2259
	Fomalhaut E.	97 18 42	2509	95 37 41	2490	93 56 15	2472	92 14 23	2454
30	Regulus W.	101 19 12	2310	103 7 25	2196	104 55 59	2182	106 44 56	2168
	Spica W.	47 25 59	2250	49 13 11	2239	51 0 50	2215	52 48 54	2199
	α Aquilæ E.	55 38 5	3406	54 15 56	3449	52 54 35	3496	51 34 6	3533
	Fomalhaut E.	83 39 5	2376	81 54 56	2363	80 10 28	2351	78 25 42	2339
	α Pegasi E.	101 10 14	2628	99 31 58	2608	97 53 14	2590	96 14 6	2574

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIb.	P. L. of Diff.	XXIb.	P. L. of Diff.
22	Spica E.	50 8 25	3104	48 40 21	3102	47 12 14	3100	45 44 4	3098
	MARS E.	86 33 43	3012	85 3 46	3008	83 33 45	3004	82 3 38	3000
	Antares E.	95 58 42	3077	94 30 4	3072	93 1 20	3067	91 32 30	3061
23	SUN W.	72 16 34	3361	73 39 35	3352	75 2 46	3343	76 26 7	3333
	Spica E.	38 22 26	3084	36 53 57	3082	35 25 25	3080	33 56 50	3078
	MARS E.	74 31 28	2971	73 0 39	2964	71 29 41	2956	69 58 33	2948
	Antares E.	84 6 26	3097	82 36 47	3019	81 6 58	3011	79 36 59	3002
24	SUN W.	83 25 56	3278	84 50 33	3265	86 15 26	3252	87 40 32	3238
	Regulus W.	28 48 27	2976	30 19 9	2961	31 50 10	2945	33 21 32	2929
	MARS E.	62 20 17	2903	60 48 2	2893	59 15 35	2883	57 42 54	2872
	Antares E.	72 4 8	2952	70 32 55	2941	69 1 29	2930	67 29 48	2918
25	SUN W.	94 50 20	3165	96 17 11	3149	97 44 21	3133	99 11 50	3116
	Regulus W.	41 3 23	2850	42 36 46	2834	44 10 30	2818	45 44 35	2801
	SATURN W.	39 25 51	2800	40 58 49	2854	42 32 6	2838	44 5 45	2822
	MARS E.	49 55 55	2814	48 21 46	2802	46 47 20	2789	45 12 38	2776
	Antares E.	59 47 29	2854	58 14 12	2840	56 40 37	2826	55 6 44	2812
	α Aquilæ E.	105 36 0	3618	104 17 45	3592	102 59 1	3567	101 39 51	3542
26	SUN W.	106 34 30	3029	108 4 7	3011	109 34 8	2992	111 4 32	2973
	Regulus W.	53 40 36	2714	55 16 57	2695	56 53 43	2677	58 30 52	2659
	SATURN W.	51 59 22	2737	53 35 13	2720	55 11 28	2702	56 48 6	2684
	MARS E.	37 14 58	2713	35 38 36	2701	34 1 58	2690	32 25 4	2679
	Antares E.	47 12 39	2740	45 36 53	2725	44 0 47	2711	42 24 22	2697
	α Aquilæ E.	94 57 33	3423	93 35 54	3413	92 13 52	3393	90 51 28	3375
27	SUN W.	118 42 33	2874	120 15 25	2854	121 48 41	2834	123 22 23	2814
	Regulus W.	66 42 52	2567	68 22 32	2548	70 2 39	2529	71 43 12	2510
	SATURN W.	64 57 26	2591	66 36 33	2573	68 16 7	2554	69 56 6	2535
	Antares E.	34 17 37	2631	32 39 25	2619	31 0 57	2608	29 22 15	2600
	α Aquilæ E.	83 54 36	3297	82 30 21	3285	81 5 51	3273	79 41 8	3263
	JUPITER E.	95 50 32	2532	94 19 4	2513	92 38 10	2494	90 56 49	2475
28	Regulus W.	80 12 31	2416	81 55 43	2397	83 39 21	2379	85 23 25	2361
	SATURN W.	78 22 38	2440	80 5 16	2421	81 48 20	2402	83 31 50	2384
	Spica W.	26 41 27	2545	28 21 37	2519	30 2 33	2491	31 44 12	2453
	α Aquilæ E.	72 34 59	3231	71 9 27	3220	69 43 54	3201	68 18 21	3224
	JUPITER E.	82 23 33	2384	80 39 35	2365	78 55 10	2347	77 10 19	2329
29	Regulus W.	94 10 16	2274	95 56 53	2256	97 43 56	2242	99 31 22	2226
	Spica W.	40 21 56	2330	42 7 12	2309	43 52 58	2289	45 39 14	2269
	α Aquilæ E.	61 12 38	2992	59 48 17	2973	58 24 21	2952	57 0 55	2930
	JUPITER E.	68 19 35	2242	66 32 10	2226	64 44 21	2210	62 56 8	2194
	Fomalhaut E.	90 32 6	2437	88 49 25	2421	87 6 20	2406	85 22 53	2391
30	Regulus W.	108 34 14	2154	110 23 51	2140	112 13 48	2128	114 4 4	2116
	Spica W.	54 37 23	2183	56 26 16	2168	58 15 31	2154	60 5 8	2141
	α Aquilæ E.	50 14 41	2617	48 56 25	2600	47 39 28	2575	46 24 0	2670
	Fomalhaut E.	76 40 38	2328	74 55 19	2319	73 9 46	2310	71 24 0	2301
	α Pegasi E.	94 34 36	2558	92 54 42	2543	91 14 29	2529	89 33 57	2517

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Tues.	1	^h 6 ^m 41 ^s 31.70	10.335	N. 23° 6' 37".0	-10.25	15' 46".18	68.78	3 33.42	0.478
Wed.	2	6 45 39.62	10.324	23 2 18.7	11.26	15 46.18	68.74	3 44.75	0.467
Thur.	3	6 49 47.27	10.312	22 57 36.3	12.26	15 46.18	68.70	3 55.81	0.455
Frid.	4	6 53 54.62	10.299	22 52 29.9	-13.26	15 46.18	68.66	4 6.58	0.442
Sat.	5	6 58 1.66	10.286	22 46 59.6	14.25	15 46.19	68.61	4 17.03	0.429
SUN.	6	7 2 8.38	10.272	22 41 5.6	15.23	15 46.20	68.56	4 27.16	0.415
Mon.	7	7 6 14.75	10.258	22 34 48.0	-16.21	15 46.21	68.51	4 36.95	0.401
Tues.	8	7 10 20.77	10.243	22 28 7.0	17.19	15 46.23	68.46	4 46.38	0.386
Wed.	9	7 14 26.40	10.227	22 21 2.7	18.16	15 46.25	68.40	4 55.43	0.370
Thur.	10	7 18 31.64	10.210	22 13 35.1	-19.12	15 46.27	68.34	5 4.10	0.353
Frid.	11	7 22 36.47	10.193	22 5 44.6	20.07	15 46.30	68.28	5 12.35	0.336
Sat.	12	7 26 40.88	10.175	21 57 31.3	21.02	15 46.34	68.22	5 20.18	0.318
SUN.	13	7 30 44.85	10.156	21 48 55.4	-21.96	15 46.38	68.15	5 27.57	0.299
Mon.	14	7 34 48.36	10.136	21 39 57.0	22.89	15 46.42	68.08	5 34.50	0.279
Tues.	15	7 38 51.38	10.116	21 30 36.5	23.81	15 46.47	68.01	5 40.95	0.259
Wed.	16	7 42 53.91	10.095	21 20 53.8	-24.72	15 46.53	67.94	5 46.91	0.238
Thur.	17	7 46 55.92	10.073	21 10 49.4	25.63	15 46.59	67.87	5 52.35	0.216
Frid.	18	7 50 57.41	10.051	21 0 23.5	26.52	15 46.66	67.80	5 57.26	0.194
Sat.	19	7 54 58.35	10.027	20 49 36.3	-27.40	15 46.73	67.72	6 1.63	0.171
SUN.	20	7 58 58.74	10.004	20 38 27.9	28.27	15 46.81	67.64	6 5.45	0.148
Mon.	21	8 2 58.55	9.980	20 26 58.7	29.14	15 46.89	67.56	6 8.70	0.124
Tues.	22	8 6 57.78	9.956	20 15 8.9	-29.99	15 46.98	67.48	6 11.36	0.100
Wed.	23	8 10 56.42	9.931	20 2 58.7	30.84	15 47.07	67.40	6 13.44	0.075
Thur.	24	8 14 54.46	9.906	19 50 28.5	31.67	15 47.17	67.32	6 14.92	0.050
Frid.	25	8 18 51.89	9.881	19 37 38.5	-32.49	15 47.27	67.23	6 15.80	0.025
Sat.	26	8 22 48.71	9.856	19 24 29.0	33.29	15 47.38	67.15	6 16.06	0.000
SUN.	27	8 26 44.92	9.830	19 11 0.2	34.09	15 47.48	67.06	6 15.71	0.026
Mon.	28	8 30 40.51	9.805	18 57 12.4	-34.87	15 47.59	66.98	6 14.74	0.051
Tues.	29	8 34 35.49	9.779	18 43 6.1	35.65	15 47.71	66.89	6 13.17	0.077
Wed.	30	8 38 29.85	9.754	18 28 41.3	36.41	15 47.83	66.81	6 10.99	0.102
Thur.	31	8 42 23.60	9.728	18 13 58.4	37.16	15 47.95	66.72	6 8.19	0.128
Frid.	32	8 46 16.74	9.702	N. 17 58 57.5	-37.90	15 48.08	66.64	6 4.78	0.154

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sideral time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Tues.	1	^h 6 ^m 41 ^s 31.08	10.334	N. 23° 6' 37".6	-10.25	^m 3 ^s 33.39	0.478	^h 6 ^m 37 ^s 57.69
Wed.	2	6 45 38.97	10.323	23 2 19.4	11.26	3 44.72	0.467	6 41 54.25
Thur.	3	6 49 46.59	10.311	22 57 37.1	12.26	3 55.78	0.455	6 45 50.81
Frid.	4	6 53 53.91	10.298	22 52 30.8	-13.26	4 6.55	0.442	6 49 47.36
Sat.	5	6 58 0.92	10.285	22 47 0.6	14.25	4 17.00	0.429	6 53 43.92
SUN.	6	7 2 7.61	10.271	22 41 6.7	15.23	4 27.13	0.415	6 57 40.48
Mon.	7	7 6 13.96	10.257	22 34 49.2	-16.21	4 36.92	0.401	7 1 37.04
Tues.	8	7 10 19.95	10.242	22 28 8.3	17.19	4 46.35	0.386	7 5 33.60
Wed.	9	7 14 25.56	10.226	22 21 4.1	18.16	4 55.40	0.370	7 9 30.16
Thur.	10	7 18 30.78	10.209	22 13 36.7	-19.12	5 4.07	0.353	7 13 26.71
Frid.	11	7 22 35.59	10.192	22 5 46.3	20.07	5 12.32	0.336	7 17 23.27
Sat.	12	7 26 39.98	10.174	21 57 33.2	21.02	5 20.15	0.318	7 21 19.83
SUN.	13	7 30 43.93	10.155	21 48 57.4	-21.96	5 27.54	0.299	7 25 16.39
Mon.	14	7 34 47.42	10.135	21 39 59.2	22.89	5 34.48	0.279	7 29 12.94
Tues.	15	7 38 50.43	10.115	21 30 38.8	23.81	5 40.93	0.259	7 33 9.50
Wed.	16	7 42 52.94	10.094	21 20 56.3	-24.72	5 46.89	0.238	7 37 6.05
Thur.	17	7 46 54.94	10.072	21 10 52.0	25.63	5 52.33	0.216	7 41 2.61
Frid.	18	7 50 56.41	10.050	21 0 26.2	26.52	5 57.25	0.194	7 44 59.17
Sat.	19	7 54 57.34	10.027	20 49 39.1	-27.40	6 1.62	0.171	7 48 55.73
SUN.	20	7 58 57.72	10.004	20 38 30.8	28.27	6 5.44	0.148	7 52 52.28
Mon.	21	8 2 57.53	9.980	20 27 1.7	29.14	6 8.69	0.124	7 56 48.84
Tues.	22	8 6 56.75	9.956	20 15 12.0	-29.99	6 11.35	0.100	8 0 45.40
Wed.	23	8 10 55.39	9.931	20 3 1.9	30.84	6 13.43	0.075	8 4 41.96
Thur.	24	8 14 53.43	9.906	19 50 31.8	31.67	6 14.91	0.050	8 8 38.51
Frid.	25	8 18 50.86	9.881	19 37 41.9	-32.49	6 15.79	0.025	8 12 35.07
Sat.	26	8 22 47.68	9.856	19 24 32.5	33.29	6 16.06	0.000	8 16 31.62
SUN.	27	8 26 43.89	9.830	19 11 3.8	34.09	6 15.71	0.026	8 20 28.18
Mon.	28	8 30 39.49	9.805	18 57 16.1	-34.87	6 14.74	0.051	8 24 24.74
Tues.	29	8 34 34.47	9.779	18 43 9.8	35.65	6 13.17	0.077	8 28 21.30
Wed.	30	8 38 28.84	9.754	18 28 45.1	36.41	6 10.99	0.102	8 32 17.85
Thur.	31	8 42 22.60	9.728	18 14 2.2	37.16	6 8.20	0.128	8 36 14.41
Frid.	32	8 46 15.76	9.702	N. 17 59 1.4	-37.90	6 4.80	0.154	8 40 10.96

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour
+9°.8565.
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE				
		λ	λ'						
1	182	99° 32' 38.3	32° 30' 0	142.94	+ 0.03	0.0072014	+ 1.1	17 ^h 19 ^m 11.60 ^s	
2	183	100 29 49.0	29 40.5	142.94	— 0.10	0.0072033	+ 0.4	17 15 15.68	
3	184	101 26 59.6	26 50.9	142.94	0.23	0.0072036	— 0.2	17 11 19.77	
4	185	102 24 10.3	24 1.4	142.95	— 0.34	0.0072024	— 0.8	17 7 23.86	
5	186	103 21 21.2	21 12.1	142.96	0.42	0.0071998	1.4	17 3 27.95	
6	187	104 18 32.3	18 23.1	142.97	0.47	0.0071957	2.0	16 59 32.04	
7	188	105 15 43.7	15 34.4	142.98	— 0.50	0.0071900	— 2.7	16 55 36.13	
8	189	106 12 55.5	12 46.0	143.00	0.49	0.0071825	3.5	16 51 40.22	
9	190	107 10 7.8	9 58.1	143.02	0.45	0.0071731	4.3	16 47 44.31	
10	191	108 7 20.6	7 10.7	143.04	— 0.39	0.0071617	— 5.2	16 43 48.39	
11	192	109 4 33.9	4 23.8	143.06	0.31	0.0071481	6.1	16 39 52.48	
12	193	110 1 47.8	1 37.5	143.08	0.20	0.0071323	7.1	16 35 56.57	
13	194	110 59 2.2	58 51.7	143.10	— 0.08	0.0071142	— 8.1	16 32 0.66	
14	195	111 56 17.1	56 6.5	143.12	+ 0.05	0.0070936	9.1	16 28 4.74	
15	196	112 53 32.5	53 21.7	143.15	0.18	0.0070704	10.2	16 24 8.83	
16	197	113 50 48.4	50 37.4	143.17	+ 0.30	0.0070446	— 11.2	16 20 12.92	
17	198	114 48 4.8	47 53.6	143.19	0.41	0.0070163	12.3	16 16 17.01	
18	199	115 45 21.6	45 10.3	143.21	0.50	0.0069855	13.4	16 12 21.10	
19	200	116 42 38.9	42 27.5	143.23	+ 0.57	0.0069521	— 14.5	16 8 25.19	
20	201	117 39 56.6	39 45.0	143.24	0.61	0.0069162	15.5	16 4 29.28	
21	202	118 37 14.6	37 2.8	143.26	0.62	0.0068778	16.5	16 0 33.37	
22	203	119 34 33.0	34 21.0	143.27	+ 0.60	0.0068371	— 17.4	15 56 37.45	
23	204	120 31 51.8	31 39.7	143.29	0.55	0.0067942	18.3	15 52 41.54	
24	205	121 29 11.0	28 58.8	143.31	0.47	0.0067493	19.1	15 48 45.63	
25	206	122 26 30.6	26 18.2	143.33	+ 0.37	0.0067024	— 19.9	15 44 49.72	
26	207	123 23 50.6	23 38.0	143.35	0.25	0.0066537	20.6	15 40 53.81	
27	208	124 21 11.1	20 58.3	143.37	+ 0.11	0.0066033	21.3	15 36 57.90	
28	209	125 18 32.2	18 19.3	143.39	— 0.02	0.0065514	— 21.9	15 33 1.99	
29	210	126 15 53.8	15 40.8	143.42	0.15	0.0064981	22.5	15 29 6.08	
30	211	127 13 16.1	13 2.9	143.45	0.28	0.0064435	23.1	15 25 10.16	
31	212	128 10 39.2	10 25.8	143.48	0.39	0.0063876	23.6	15 21 14.25	
32	213	129 8 3.2	7 49.7	143.52	— 0.48	0.0063304	— 24.1	15 17 18.34	
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .									Diff. for 1 Hour, — 9 ^s .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI-DIAMETER.

HORIZONTAL PARALLAX.

UPPER TRANSIT.

AGE.

Noon.

Midnight.

Noon.

Diff. for
1 Hour.

Midnight.

Diff. for
1 Hour.Meridian of
Greenwich.Diff. for
1 Hour.

Noon.

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	
1	16' 30.1	16' 34.6	60' 27.3	+1.52	60' 43.7	+1.20	^h 11 ^m 25.7	^m 2.65	^d 14.1
2	16 38.0	16 40.1	60 56.0	0.84	61 3.9	+0.47	12 30.6	2.69	15.1
3	16 41.0	16 40.7	61 7.2	+0.08	61 5.8	-0.30	13 35.2	2.63	16.1
4	16 39.0	16 36.3	60 59.9	-0.67	60 49.7	-1.00	14 36.8	2.48	17.1
5	16 32.5	16 27.8	60 35.8	1.31	60 18.6	1.54	15 34.1	2.29	18.1
6	16 22.4	16 16.4	59 58.8	1.74	59 36.9	1.89	16 27.0	2.14	19.1
7	16 10.1	16 3.5	59 13.5	-1.99	58 49.2	-2.04	17 16.6	2.02	20.1
8	15 56.7	15 50.1	58 24.5	2.05	58 0.0	2.03	18 3.8	1.95	21.1
9	15 43.5	15 37.2	57 35.9	1.98	57 12.6	1.91	18 50.0	1.92	22.1
10	15 31.1	15 25.3	56 50.2	-1.81	56 29.1	-1.70	19 36.2	1.94	23.1
11	15 19.9	15 14.9	56 9.3	1.59	55 50.9	1.48	20 23.2	1.98	24.1
12	15 10.3	15 6.1	55 33.9	1.36	55 18.4	1.24	21 11.5	2.06	25.1
13	15 2.2	14 58.8	55 4.3	-1.12	54 51.6	-1.00	22 1.0	2.08	26.1
14	14 55.7	14 53.0	54 40.3	0.89	54 30.3	0.78	22 51.3	2.08	27.1
15	14 50.6	14 48.6	54 21.6	0.67	54 14.2	0.57	23 41.8	2.08	28.1
16	14 46.9	14 45.6	54 8.0	-0.46	54 3.1	-0.35	^h 0 ^m 31.0		29.1
17	14 44.6	14 44.0	53 59.5	0.25	53 57.3	-0.13	0 31.0	2.02	0.5
18	14 43.7	14 43.9	53 56.4	-0.01	53 56.9	+0.11	1 18.7	1.95	1.5
19	14 44.4	14 45.5	53 59.0	+0.25	54 2.7	+0.39	2 4.5	1.87	2.5
20	14 47.0	14 48.9	54 8.2	0.54	54 15.5	0.69	2 48.4	1.80	3.5
21	14 51.4	14 54.4	54 24.6	0.85	54 35.7	1.01	3 30.8	1.75	4.5
22	14 58.0	15 2.2	54 48.9	+1.19	55 4.2	+1.36	4 12.5	1.74	5.5
23	15 6.9	15 12.2	55 21.5	1.54	55 41.0	1.71	4 54.5	1.77	6.5
24	15 18.1	15 24.4	56 2.5	1.88	56 25.9	2.03	5 37.5	1.85	7.5
25	15 31.3	15 38.5	56 51.0	+2.16	57 17.6	+2.27	6 23.3	1.99	8.5
26	15 46.1	15 53.8	57 45.3	2.34	58 13.7	2.38	7 12.9	2.15	9.5
27	16 1.6	16 9.4	58 42.4	2.38	59 10.7	2.32	8 6.8	2.34	10.5
28	16 16.8	16 23.7	59 38.1	+2.31	60 3.7	+2.04	9 5.4	2.54	11.5
29	16 30.1	16 35.6	60 27.0	1.81	60 47.1	1.52	10 8.4	2.67	12.5
30	16 40.0	16 43.3	61 3.5	1.19	61 15.6	+0.91	11 13.4	2.69	13.5
31	16 45.3	16 45.9	61 22.9	+0.40	61 25.2	-0.03	12 17.5	2.60	14.5
32	16 45.2	16 43.0	61 22.4	-0.45	61 14.6	-0.85	13 18.3	2.45	15.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	17 34 45.82	2.6642	S. 23° 21' 28.5	5.009	0	19 46 16.08	2.7465	S. 23° 54' 42.9	2.777
1	17 37 25.84	2.6698	23 26 24.1	4.844	1	19 49 0.79	2.7438	23 50 50.8	3.959
2	17 40 6.19	2.6753	23 31 9.8	4.677	2	19 51 45.34	2.7410	23 46 47.8	4.141
3	17 42 46.87	2.6807	23 35 45.4	4.508	3	19 54 29.71	2.7379	23 42 33.9	4.329
4	17 45 27.87	2.6858	23 40 10.8	4.338	4	19 57 13.89	2.7347	23 38 9.1	4.502
5	17 48 9.17	2.6908	23 44 26.0	4.168	5	19 59 57.87	2.7313	23 33 33.6	4.681
6	17 50 50.77	2.6958	23 48 31.0	3.997	6	20 2 41.65	2.7278	23 28 47.4	4.859
7	17 53 32.67	2.7007	23 52 25.6	3.824	7	20 5 25.21	2.7241	23 23 50.5	5.037
8	17 56 14.85	2.7053	23 56 9.8	3.649	8	20 8 8.54	2.7202	23 18 43.0	5.213
9	17 58 57.30	2.7098	23 59 43.5	3.473	9	20 10 51.64	2.7162	23 13 25.0	5.388
10	18 1 40.02	2.7142	24 3 6.6	3.296	10	20 13 34.49	2.7121	23 7 56.5	5.563
11	18 4 23.00	2.7183	24 6 19.0	3.118	11	20 16 17.09	2.7077	23 2 17.6	5.733
12	18 7 6.22	2.7223	24 9 20.7	2.939	12	20 18 59.42	2.7032	22 56 28.5	5.904
13	18 9 49.68	2.7262	24 12 11.7	2.760	13	20 21 41.48	2.6987	22 50 29.1	6.075
14	18 12 33.36	2.7298	24 14 51.9	2.579	14	20 24 23.27	2.6941	22 44 19.5	6.243
15	18 15 17.26	2.7334	24 17 21.2	2.397	15	20 27 4.77	2.6893	22 37 59.9	6.410
16	18 18 1.37	2.7366	24 19 39.6	2.215	16	20 29 45.98	2.6843	22 31 30.3	6.576
17	18 20 45.67	2.7399	24 21 47.0	2.033	17	20 32 26.81	2.6793	22 24 50.8	6.741
18	18 23 30.16	2.7429	24 23 43.5	1.849	18	20 35 7.49	2.6741	22 18 1.4	6.904
19	18 26 14.82	2.7458	24 25 28.9	1.664	19	20 37 47.78	2.6688	22 11 2.3	7.065
20	18 28 59.65	2.7484	24 27 3.2	1.478	20	20 40 27.74	2.6633	22 3 53.6	7.226
21	18 31 44.63	2.7508	24 28 26.3	1.292	21	20 43 7.37	2.6578	21 56 35.3	7.383
22	18 34 29.75	2.7532	24 29 38.3	1.106	22	20 45 46.66	2.6521	21 49 7.6	7.540
23	18 37 15.01	2.7553	S. 24 30 39.0	0.919	23	20 48 25.62	2.6464	S. 21 41 30.5	7.696
WEDNESDAY 2.					FRIDAY 4.				
0	18 40 0.39	2.7579	S. 24 31 28.5	0.731	0	20 51 4.23	2.6405	S. 21 33 44.1	7.849
1	18 42 45.88	2.7599	24 32 6.7	0.544	1	20 53 42.48	2.6346	21 25 48.6	8.001
2	18 45 31.46	2.7604	24 32 33.7	0.356	2	20 56 20.38	2.6287	21 17 44.0	8.159
3	18 48 17.13	2.7617	24 32 49.4	- 0.167	3	20 58 57.92	2.6226	21 9 30.4	8.300
4	18 51 2.87	2.7629	24 32 53.8	+ 0.023	4	21 1 35.09	2.6163	21 1 8.0	8.447
5	18 53 48.68	2.7639	24 32 46.8	0.211	5	21 4 11.88	2.6100	20 52 36.8	8.592
6	18 56 34.54	2.7647	24 32 28.5	0.400	6	21 6 48.29	2.6037	20 43 56.9	8.736
7	18 59 20.44	2.7653	24 31 58.8	0.590	7	21 9 24.32	2.5973	20 35 8.5	8.877
8	19 2 6.37	2.7657	24 31 17.7	0.779	8	21 11 59.96	2.5908	20 26 11.7	9.017
9	19 4 52.32	2.7659	24 30 25.3	0.968	9	21 14 35.22	2.5844	20 17 6.5	9.155
10	19 7 38.28	2.7659	24 29 21.5	1.157	10	21 17 10.09	2.5778	20 7 53.1	9.291
11	19 10 24.23	2.7657	24 28 6.4	1.347	11	21 19 44.56	2.5711	19 58 31.6	9.426
12	19 13 10.17	2.7654	24 26 39.9	1.536	12	21 22 18.62	2.5644	19 49 2.1	9.567
13	19 15 56.08	2.7648	24 25 2.1	1.725	13	21 24 52.28	2.5577	19 39 24.7	9.698
14	19 18 41.95	2.7641	24 23 12.9	1.914	14	21 27 25.54	2.5509	19 29 39.5	9.817
15	19 21 27.77	2.7632	24 21 12.4	2.103	15	21 29 58.39	2.5441	19 19 46.6	9.944
16	19 24 13.53	2.7621	24 19 0.6	2.291	16	21 32 30.83	2.5372	19 9 46.2	10.068
17	19 26 59.22	2.7607	24 16 37.5	2.478	17	21 35 2.85	2.5302	18 59 38.4	10.192
18	19 29 44.82	2.7592	24 14 3.2	2.665	18	21 37 34.46	2.5233	18 49 23.2	10.313
19	19 32 30.33	2.7576	24 11 17.7	2.852	19	21 40 5.65	2.5164	18 39 0.8	10.429
20	19 35 15.73	2.7558	24 8 21.0	3.038	20	21 42 36.43	2.5095	18 28 31.3	10.549
21	19 38 1.02	2.7538	24 5 13.1	3.224	21	21 45 6.79	2.5025	18 17 54.9	10.664
22	19 40 46.19	2.7516	24 1 54.1	3.409	22	21 47 36.73	2.4955	18 7 11.6	10.777
23	19 43 31.21	2.7491	23 58 24.0	3.593	23	21 50 6.25	2.4884	17 56 21.6	10.889
24	19 46 16.08	2.7465	S. 23 54 42.9	3.777	24	21 52 35.34	2.4813	S. 17 45 24.9	10.999

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	21 ^h 52 ^m 35.34	2.4813	S. 17° 45' 24.9	10.999	0	23 ^h 44 ^m 1.73	2.1799	S. 7° 27' 12.6	14.075
1	21 55 4.01	2.4743	17 34 21.7	11.107	1	23 46 12.38	2.1751	7 13 7.4	14.097
2	21 57 32.26	2.4673	17 23 12.1	11.219	2	23 48 22.74	2.1703	6 59 0.9	14.119
3	22 0 0.09	2.4603	17 11 56.3	11.315	3	23 50 32.81	2.1655	6 44 53.1	14.140
4	22 2 27.50	2.4533	17 0 34.3	11.417	4	23 52 42.60	2.1609	6 30 44.1	14.158
5	22 4 54.48	2.4463	16 49 6.2	11.517	5	23 54 52.12	2.1564	6 16 34.1	14.174
6	22 7 21.04	2.4393	16 37 32.2	11.615	6	23 57 1.37	2.1519	6 2 23.2	14.189
7	22 9 47.18	2.4323	16 25 52.4	11.711	7	23 59 10.35	2.1475	5 48 11.4	14.204
8	22 12 12.90	2.4253	16 14 6.9	11.805	8	0 1 19.07	2.1430	5 33 58.7	14.217
9	22 14 38.20	2.4183	16 2 15.8	11.897	9	0 3 27.54	2.1380	5 19 45.3	14.229
10	22 17 3.09	2.4113	15 50 19.2	11.987	10	0 5 35.75	2.1348	5 5 31.2	14.239
11	22 19 27.56	2.4043	15 38 17.3	12.075	11	0 7 43.71	2.1307	4 51 16.6	14.247
12	22 21 51.61	2.3974	15 26 10.2	12.161	12	0 9 51.43	2.1267	4 37 1.5	14.255
13	22 24 15.25	2.3906	15 13 58.0	12.246	13	0 11 58.91	2.1227	4 22 46.0	14.261
14	22 26 38.48	2.3837	15 1 40.7	12.329	14	0 14 6.16	2.1189	4 8 30.2	14.266
15	22 29 1.29	2.3768	14 49 18.5	12.409	15	0 16 13.18	2.1159	3 54 14.1	14.269
16	22 31 23.69	2.3700	14 36 51.6	12.488	16	0 18 19.98	2.1115	3 39 57.9	14.273
17	22 33 45.69	2.3632	14 24 20.0	12.565	17	0 20 26.56	2.1078	3 25 41.5	14.273
18	22 36 7.28	2.3565	14 11 43.8	12.640	18	0 22 32.92	2.1042	3 11 25.1	14.273
19	22 38 28.47	2.3496	13 59 3.2	12.713	19	0 24 39.07	2.1008	2 57 8.8	14.270
20	22 40 49.26	2.3432	13 46 18.3	12.784	20	0 26 45.02	2.0975	2 42 52.7	14.268
21	22 43 9.65	2.3368	13 33 29.1	12.854	21	0 28 50.77	2.0942	2 28 36.7	14.264
22	22 45 29.65	2.3300	13 20 35.8	12.922	22	0 30 56.32	2.0909	2 14 21.0	14.258
23	22 47 49.25	2.3234	S. 13° 7' 38.5	12.987	23	0 33 1.68	2.0878	S. 2° 0' 5.7	14.259
SUNDAY 6.					TUESDAY 8.				
0	22 50 8.46	2.3169	S. 12° 54' 37.4	13.050	0	0 35 6.85	2.0847	S. 1° 45' 50.8	14.244
1	22 52 27.28	2.3105	12 41 32.5	13.119	1	0 37 11.84	2.0817	1 31 36.4	14.236
2	22 54 45.72	2.3042	12 28 23.9	13.173	2	0 39 16.66	2.0789	1 17 22.5	14.226
3	22 57 3.78	2.2979	12 15 11.7	13.223	3	0 41 21.31	2.0761	1 3 9.3	14.214
4	22 59 21.47	2.2917	12 1 56.1	13.268	4	0 43 25.79	2.0733	0 48 56.8	14.202
5	23 1 38.79	2.2856	11 48 37.1	13.344	5	0 45 30.10	2.0705	0 34 45.1	14.188
6	23 3 55.74	2.2794	11 35 14.8	13.397	6	0 47 34.25	2.0679	0 20 34.2	14.174
7	23 6 12.32	2.2733	11 21 49.4	13.449	7	0 49 38.25	2.0654	S. 0° 6' 24.2	14.158
8	23 8 28.54	2.2673	11 8 20.9	13.499	8	0 51 42.10	2.0630	N. 0° 7' 44.8	14.141
9	23 10 44.40	2.2613	10 54 49.5	13.547	9	0 53 45.81	2.0607	0 21 52.7	14.123
10	23 12 59.90	2.2553	10 41 15.3	13.593	10	0 55 49.38	2.0584	0 35 59.6	14.105
11	23 15 15.04	2.2494	10 27 38.3	13.638	11	0 57 52.82	2.0562	0 50 5.3	14.084
12	23 17 29.83	2.2437	10 13 58.7	13.681	12	0 59 56.12	2.0540	1 4 9.7	14.063
13	23 19 44.28	2.2380	10 0 16.6	13.723	13	1 1 59.30	2.0520	1 18 12.8	14.041
14	23 21 58.39	2.2324	9 46 32.0	13.763	14	1 4 2.36	2.0500	1 32 14.6	14.018
15	23 24 12.17	2.2269	9 32 45.0	13.802	15	1 6 5.30	2.0481	1 46 15.0	13.994
16	23 26 25.62	2.2214	9 18 55.8	13.839	16	1 8 8.13	2.0463	2 0 13.9	13.968
17	23 28 38.74	2.2159	9 5 4.4	13.873	17	1 10 10.85	2.0444	2 14 11.2	13.942
18	23 30 51.53	2.2105	8 51 11.0	13.907	18	1 12 13.46	2.0427	2 28 6.9	13.915
19	23 33 4.00	2.2053	8 37 15.6	13.938	19	1 14 15.97	2.0411	2 42 1.0	13.887
20	23 35 16.16	2.2001	8 23 18.4	13.968	20	1 16 18.39	2.0396	2 55 53.3	13.857
21	23 37 28.01	2.1949	8 9 19.4	13.997	21	1 18 20.73	2.0382	3 9 43.8	13.826
22	23 39 39.55	2.1898	7 55 18.7	14.025	22	1 20 22.98	2.0368	3 23 32.4	13.796
23	23 41 50.79	2.1846	7 41 16.4	14.051	23	1 22 25.15	2.0354	3 37 19.2	13.763
24	23 44 1.73	2.1799	S. 7° 27' 12.6	14.075	24	1 24 27.23	2.0341	N. 3° 51' 4.0	13.730

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	1 ^h 24 ^m 27.23	2.0341	N. 3° 51' 4.0	13.730	0	3 ^h 1 ^m 52.79	2.0469	N. 13° 54' 48.7	11.107
1	1 26 29.24	2.0330	4 4 46.8	13.696	1	3 3 55.65	2.0464	14 5 52.9	11.033
2	1 28 31.19	2.0319	4 18 27.5	13.660	2	3 5 58.60	2.0500	14 16 52.6	10.958
3	1 30 33.07	2.0308	4 32 6.0	13.624	3	3 8 1.65	2.0516	14 27 47.8	10.882
4	1 32 34.89	2.0299	4 45 42.3	13.587	4	3 10 4.79	2.0538	14 38 38.4	10.805
5	1 34 36.66	2.0290	4 59 16.4	13.549	5	3 12 8.03	2.0548	14 49 24.4	10.738
6	1 36 38.37	2.0281	5 12 48.2	13.510	6	3 14 11.37	2.0565	15 0 5.8	10.651
7	1 38 40.03	2.0273	5 26 17.6	13.470	7	3 16 14.81	2.0589	15 10 42.5	10.572
8	1 40 41.65	2.0267	5 39 44.6	13.430	8	3 18 18.35	2.0589	15 21 14.4	10.492
9	1 42 43.24	2.0261	5 53 9.2	13.388	9	3 20 22.00	2.0617	15 31 41.6	10.412
10	1 44 44.79	2.0255	6 6 31.2	13.345	10	3 22 25.76	2.0635	15 42 3.9	10.331
11	1 46 46.30	2.0249	6 19 50.6	13.303	11	3 24 29.62	2.0653	15 52 21.3	10.249
12	1 48 47.78	2.0245	6 33 7.4	13.257	12	3 26 33.59	2.0671	16 2 33.8	10.167
13	1 50 49.24	2.0249	6 46 21.5	13.213	13	3 28 37.67	2.0680	16 12 41.3	10.084
14	1 52 50.68	2.0239	6 59 32.9	13.166	14	3 30 41.87	2.0709	16 22 43.9	10.001
15	1 54 52.11	2.0237	7 12 41.4	13.119	15	3 32 46.18	2.0738	16 32 41.5	9.917
16	1 56 53.52	2.0235	7 25 47.1	13.071	16	3 34 50.60	2.0747	16 42 34.0	9.839
17	1 58 54.93	2.0234	7 38 49.9	13.029	17	3 36 55.14	2.0767	16 52 21.3	9.746
18	2 0 56.33	2.0233	7 51 49.8	12.973	18	3 38 59.80	2.0787	17 2 3.5	9.660
19	2 2 57.73	2.0233	8 4 46.7	12.928	19	3 41 4.58	2.0807	17 11 40.5	9.578
20	2 4 59.13	2.0233	8 17 40.5	12.871	20	3 43 9.48	2.0837	17 21 12.2	9.484
21	2 7 0.53	2.0234	8 30 31.2	12.819	21	3 45 14.50	2.0847	17 30 38.6	9.386
22	2 9 1.94	2.0237	8 43 18.7	12.768	22	3 47 19.64	2.0867	17 39 59.7	9.307
23	2 11 3.37	2.0240	N. 8 56 3.1	12.719	23	3 49 24.90	2.0887	N. 17 49 15.4	9.217
THURSDAY 10.					SATURDAY 12.				
0	2 13 4.82	2.0243	N. 9 8 44.2	12.657	0	3 51 30.29	2.0906	N. 17 58 25.8	9.127
1	2 15 6.29	2.0247	9 21 22.0	12.609	1	3 53 35.80	2.0929	18 7 30.7	9.036
2	2 17 7.78	2.0250	9 33 56.4	12.546	2	3 55 41.44	2.0951	18 16 30.1	8.944
3	2 19 9.29	2.0254	9 46 27.5	12.489	3	3 57 47.21	2.0972	18 25 24.0	8.851
4	2 21 10.83	2.0260	9 58 55.1	12.431	4	3 59 53.10	2.0999	18 34 12.3	8.758
5	2 23 12.41	2.0267	10 11 19.2	12.379	5	4 1 59.11	2.1013	18 42 55.0	8.665
6	2 25 14.03	2.0273	10 23 39.7	12.319	6	4 4 5.25	2.1034	18 51 32.1	8.571
7	2 27 15.69	2.0280	10 35 56.6	12.253	7	4 6 11.52	2.1056	19 0 3.5	8.476
8	2 29 17.39	2.0287	10 48 9.9	12.198	8	4 8 17.92	2.1077	19 8 29.2	8.380
9	2 31 19.13	2.0294	11 0 19.6	12.130	9	4 10 24.44	2.1098	19 16 49.1	8.283
10	2 33 20.92	2.0303	11 12 25.5	12.067	10	4 12 31.09	2.1119	19 25 3.2	8.187
11	2 35 22.77	2.0319	11 24 27.6	12.003	11	4 14 37.87	2.1140	19 33 11.5	8.089
12	2 37 24.67	2.0333	11 36 25.8	11.938	12	4 16 44.77	2.1161	19 41 13.9	7.991
13	2 39 26.63	2.0338	11 48 20.1	11.873	13	4 18 51.80	2.1189	19 49 10.4	7.899
14	2 41 28.65	2.0349	12 0 10.5	11.808	14	4 20 58.96	2.1204	19 57 0.9	7.793
15	2 43 30.74	2.0353	12 11 57.0	11.748	15	4 23 6.25	2.1225	20 4 45.5	7.683
16	2 45 32.89	2.0364	12 23 39.5	11.674	16	4 25 13.66	2.1246	20 12 24.1	7.583
17	2 47 35.11	2.0376	12 35 17.9	11.605	17	4 27 21.20	2.1267	20 19 56.6	7.492
18	2 49 37.40	2.0388	12 46 52.1	11.536	18	4 29 28.87	2.1288	20 27 23.1	7.390
19	2 51 39.77	2.0401	12 58 22.2	11.467	19	4 31 36.66	2.1308	20 34 43.4	7.288
20	2 53 42.21	2.0414	13 9 48.1	11.396	20	4 33 44.57	2.1329	20 41 57.6	7.185
21	2 55 44.73	2.0427	13 21 9.7	11.325	21	4 35 52.61	2.1350	20 49 5.6	7.089
22	2 57 47.33	2.0441	13 32 27.1	11.253	22	4 38 0.77	2.1370	20 56 7.4	6.978
23	2 59 50.02	2.0455	13 43 40.1	11.180	23	4 40 9.05	2.1391	21 3 2.9	6.873
24	3 1 52.79	2.0469	N. 13 54 48.7	11.107	24	4 42 17.46	2.1411	N. 21 9 52.2	6.769

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	^h 4 ^m 42 ^s 17.46	2.1411	N. 21° 9' 52.2"	6.769	0	^h 6 ^m 26 ^s 46.25	2.1958	N. 24° 25' 46.6"	1.978
1	4 44 25.98	2.1430	21 16 35.2	6.663	1	6 28 57.98	2.1954	24 26 59.7	1.158
2	4 46 34.62	2.1450	21 23 11.8	6.557	2	6 31 9.70	2.1953	24 28 5.6	1.630
3	4 48 43.38	2.1469	21 29 42.0	6.450	3	6 33 21.42	2.1951	24 29 4.4	0.990
4	4 50 52.25	2.1488	21 36 5.8	6.343	4	6 35 33.12	2.1948	24 29 56.0	0.800
5	4 53 1.24	2.1506	21 42 23.2	6.236	5	6 37 44.80	2.1944	24 30 40.4	0.680
6	4 55 10.35	2.1527	21 48 34.1	6.128	6	6 39 56.45	2.1940	24 31 17.6	0.561
7	4 57 19.57	2.1545	21 54 38.5	6.019	7	6 42 8.08	2.1936	24 31 47.7	0.442
8	4 59 28.89	2.1563	22 0 36.4	5.911	8	6 44 19.68	2.1932	24 32 10.6	0.322
9	5 1 38.32	2.1581	22 6 27.8	5.802	9	6 46 31.26	2.1928	24 32 26.4	0.203
10	5 3 47.86	2.1598	22 12 12.6	5.692	10	6 48 42.80	2.1919	24 32 35.0	+ 0.084
11	5 5 57.50	2.1616	22 17 50.8	5.581	11	6 50 54.29	2.1919	24 32 36.5	- 0.034
12	5 8 7.25	2.1633	22 23 22.3	5.470	12	6 53 5.74	2.1905	24 32 30.9	0.153
13	5 10 17.10	2.1650	22 28 47.2	5.359	13	6 55 17.15	2.1897	24 32 18.1	0.978
14	5 12 27.05	2.1666	22 34 5.4	5.248	14	6 57 28.50	2.1888	24 31 58.2	0.391
15	5 14 37.09	2.1682	22 39 16.9	5.136	15	6 59 39.80	2.1878	24 31 31.2	0.549
16	5 16 47.23	2.1698	22 44 21.7	5.023	16	7 1 51.04	2.1868	24 30 57.1	0.698
17	5 18 57.46	2.1713	22 49 19.7	4.910	17	7 4 2.22	2.1858	24 30 15.9	0.746
18	5 21 7.79	2.1728	22 54 10.9	4.797	18	7 6 13.34	2.1847	24 29 27.6	0.883
19	5 23 18.20	2.1743	22 58 55.3	4.683	19	7 8 24.39	2.1835	24 28 32.3	0.981
20	5 25 28.70	2.1757	23 3 32.9	4.570	20	7 10 35.36	2.1823	24 27 29.9	1.068
21	5 27 39.28	2.1770	23 8 3.7	4.456	21	7 12 46.26	2.1810	24 26 20.4	1.216
22	5 29 49.94	2.1783	23 12 27.6	4.341	22	7 14 57.08	2.1797	24 25 3.9	1.333
23	5 32 0.68	2.1796	N. 23 16 44.6	4.227	23	7 17 7.82	2.1783	N. 24 23 40.4	1.450
MONDAY 14.					WEDNESDAY 16.				
0	5 34 11.50	2.1809	N. 23 20 54.8	4.112	0	7 19 18.48	2.1789	N. 24 22 9.9	1.587
1	5 36 22.39	2.1821	23 24 58.0	3.995	1	7 21 29.05	2.1754	24 20 32.4	1.683
2	5 38 33.35	2.1839	23 28 54.2	3.879	2	7 23 39.52	2.1738	24 18 47.9	1.799
3	5 40 44.38	2.1843	23 32 43.5	3.763	3	7 25 49.90	2.1728	24 16 56.5	1.914
4	5 42 55.47	2.1854	23 36 25.8	3.647	4	7 28 0.18	2.1705	24 14 58.2	2.029
5	5 45 6.63	2.1865	23 40 1.1	3.530	5	7 30 10.36	2.1687	24 12 53.0	2.145
6	5 47 17.85	2.1874	23 43 29.4	3.413	6	7 32 20.43	2.1669	24 10 40.8	2.260
7	5 49 29.12	2.1883	23 46 50.7	3.296	7	7 34 30.39	2.1651	24 8 21.8	2.374
8	5 51 40.44	2.1892	23 50 4.9	3.178	8	7 36 40.24	2.1639	24 5 56.0	2.488
9	5 53 51.82	2.1900	23 53 12.1	3.061	9	7 38 49.96	2.1613	24 3 23.3	2.602
10	5 56 3.24	2.1907	23 56 12.2	2.943	10	7 40 59.60	2.1593	24 0 43.8	2.715
11	5 58 14.70	2.1914	23 59 5.2	2.825	11	7 43 9.10	2.1573	23 57 57.5	2.827
12	6 0 26.21	2.1921	24 1 51.2	2.707	12	7 45 18.48	2.1558	23 55 4.5	2.940
13	6 2 37.75	2.1927	24 4 30.1	2.588	13	7 47 27.73	2.1531	23 52 4.7	3.052
14	6 4 49.33	2.1932	24 7 1.8	2.469	14	7 49 36.85	2.1509	23 48 58.2	3.163
15	6 7 0.94	2.1937	24 9 26.4	2.351	15	7 51 45.84	2.1487	23 45 45.1	3.274
16	6 9 12.58	2.1942	24 11 43.9	2.232	16	7 53 54.69	2.1464	23 42 25.3	3.386
17	6 11 24.24	2.1945	24 13 54.3	2.113	17	7 56 3.40	2.1441	23 38 58.8	3.497
18	6 13 35.92	2.1948	24 15 57.5	1.994	18	7 58 11.98	2.1417	23 35 25.7	3.608
19	6 15 47.62	2.1951	24 17 53.6	1.875	19	8 0 20.41	2.1393	23 31 46.1	3.715
20	6 17 59.38	2.1953	24 19 42.5	1.756	20	8 2 28.70	2.1369	23 27 59.9	3.824
21	6 20 11.05	2.1954	24 21 24.3	1.637	21	8 4 36.84	2.1344	23 24 7.2	3.933
22	6 22 22.78	2.1955	24 22 58.9	1.517	22	8 6 44.83	2.1319	23 20 8.0	4.041
23	6 24 34.51	2.1956	24 24 26.3	1.397	23	8 8 52.67	2.1294	23 16 2.3	4.148
24	6 26 46.25	2.1956	N. 24 25 46.6	1.278	24	8 11 0.36	2.1268	N. 23 11 50.2	4.255

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	8 11 0.36	2.1968	N.23° 11' 50.2	4.955	0	9 49 39.17	1.9798	N.17° 55' 32.6	6.676
1	8 13 7.89	2.1949	23 7 31.7	4.362	1	9 51 37.87	1.9767	17 46 49.8	6.751
2	8 15 15.26	2.1915	23 3 6.8	4.468	2	9 53 36.38	1.9737	17 38 2.5	6.826
3	8 17 22.47	2.1187	22 58 35.6	4.573	3	9 55 34.71	1.9707	17 29 10.7	6.901
4	8 19 29.51	2.1160	22 53 58.1	4.678	4	9 57 32.86	1.9677	17 20 14.4	6.975
5	8 21 36.39	2.1132	22 49 14.3	4.783	5	9 59 30.83	1.9647	17 11 13.7	7.047
6	8 23 43.10	2.1104	22 44 24.2	4.886	6	10 1 28.62	1.9617	17 2 8.7	7.119
7	8 25 49.64	2.1076	22 39 28.0	4.989	7	10 3 26.23	1.9587	16 52 59.4	7.191
8	8 27 56.01	2.1047	22 34 25.6	5.092	8	10 5 23.67	1.9558	16 43 45.8	7.262
9	8 30 2.21	2.1019	22 29 17.0	5.194	9	10 7 20.93	1.9529	16 34 28.0	7.333
10	8 32 8.24	2.0990	22 24 2.3	5.295	10	10 9 18.02	1.9501	16 25 6.0	7.401
11	8 34 14.09	2.0960	22 18 41.6	5.396	11	10 11 14.94	1.9472	16 15 39.9	7.470
12	8 36 19.76	2.0930	22 13 14.8	5.497	12	10 13 11.68	1.9443	16 6 9.6	7.538
13	8 38 25.25	2.0900	22 7 42.0	5.596	13	10 15 8.25	1.9415	15 56 35.3	7.605
14	8 40 30.56	2.0871	22 2 3.3	5.695	14	10 17 4.66	1.9386	15 46 57.0	7.672
15	8 42 35.70	2.0841	21 56 18.6	5.794	15	10 19 0.91	1.9361	15 37 14.7	7.738
16	8 44 40.65	2.0810	21 50 28.0	5.892	16	10 20 56.99	1.9333	15 27 28.5	7.803
17	8 46 45.42	2.0780	21 44 31.6	5.989	17	10 22 52.91	1.9306	15 17 38.4	7.868
18	8 48 50.01	2.0749	21 38 29.4	6.085	18	10 24 48.66	1.9279	15 7 44.4	7.932
19	8 50 54.41	2.0718	21 32 21.4	6.181	19	10 26 44.26	1.9253	14 57 46.6	7.994
20	8 52 58.62	2.0687	21 26 7.7	6.276	20	10 28 39.70	1.9227	14 47 45.1	8.056
21	8 55 2.65	2.0656	21 19 48.3	6.371	21	10 30 34.99	1.9202	14 37 39.8	8.118
22	8 57 6.49	2.0624	21 13 23.2	6.466	22	10 32 30.13	1.9177	14 27 30.9	8.179
23	8 59 10.14	2.0592	N.21 6 52.4	6.560	23	10 34 25.12	1.9152	N.14 17 18.3	8.240
FRIDAY 18.					SUNDAY 20.				
0	9 1 13.60	2.0561	N.21 0 16.0	6.652	0	10 36 19.96	1.9128	N.14 7 2.1	10.300
1	9 3 16.87	2.0529	20 53 34.1	6.744	1	10 38 14.66	1.9104	13 56 42.3	10.359
2	9 5 19.95	2.0498	20 46 46.7	6.835	2	10 40 9.21	1.9080	13 46 19.0	10.417
3	9 7 22.84	2.0466	20 39 53.9	6.926	3	10 42 3.62	1.9057	13 35 52.3	10.474
4	9 9 25.54	2.0433	20 32 55.6	7.017	4	10 43 57.89	1.9034	13 25 22.1	10.531
5	9 11 28.04	2.0401	20 25 51.9	7.106	5	10 45 52.03	1.9012	13 14 48.5	10.588
6	9 13 30.35	2.0369	20 18 42.9	7.194	6	10 47 46.03	1.8989	13 4 11.6	10.643
7	9 15 32.47	2.0337	20 11 28.6	7.283	7	10 49 39.90	1.8967	12 53 31.4	10.698
8	9 17 34.40	2.0305	20 4 9.0	7.371	8	10 51 33.64	1.8946	12 42 47.9	10.753
9	9 19 36.13	2.0273	19 56 44.1	7.457	9	10 53 27.26	1.8926	12 32 1.1	10.807
10	9 21 37.67	2.0241	19 49 14.1	7.542	10	10 55 20.75	1.8905	12 21 11.1	10.859
11	9 23 39.02	2.0208	19 41 39.0	7.628	11	10 57 14.12	1.8885	12 10 18.0	10.910
12	9 25 40.17	2.0176	19 33 58.7	7.713	12	10 59 7.37	1.8865	11 59 21.9	10.961
13	9 27 41.13	2.0144	19 26 13.4	7.797	13	11 1 0.51	1.8847	11 48 22.7	11.012
14	9 29 41.90	2.0112	19 18 23.1	7.880	14	11 2 53.53	1.8828	11 37 20.4	11.063
15	9 31 42.48	2.0081	19 10 27.8	7.963	15	11 4 46.44	1.8809	11 26 15.1	11.113
16	9 33 42.87	2.0049	19 2 27.5	8.046	16	11 6 39.24	1.8792	11 15 6.8	11.162
17	9 35 43.07	2.0017	18 54 22.3	8.129	17	11 8 31.94	1.8775	11 3 55.7	11.209
18	9 37 43.08	1.9986	18 46 12.3	8.207	18	11 10 24.54	1.8758	10 52 41.7	11.256
19	9 39 42.90	1.9954	18 37 57.5	8.287	19	11 12 17.04	1.8742	10 41 24.9	11.303
20	9 41 42.53	1.9922	18 29 37.9	8.366	20	11 14 9.44	1.8726	10 30 5.3	11.350
21	9 43 41.97	1.9891	18 21 13.6	8.444	21	11 16 1.75	1.8711	10 18 42.9	11.396
22	9 45 41.22	1.9860	18 12 44.6	8.522	22	11 17 53.97	1.8697	10 7 17.8	11.441
23	9 47 40.29	1.9829	18 4 10.9	8.600	23	11 19 46.11	1.8682	9 55 50.0	11.485
24	9 49 39.17	1.9798	N.17 55 32.6	8.676	24	11 21 38.16	1.8668	N. 9 44 19.6	11.528

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s 11 21 38.16	1.8668	N. 9 44 19.6	11.528	0	h m s 12 50 45.50	1.8707	S. 0 6 37.7	12.837
1	11 23 30.13	1.8655	9 32 46.6	11.571	1	12 52 37.79	1.8724	0 19 28.3	12.848
2	11 25 22.02	1.8643	9 21 11.1	11.613	2	12 54 30.19	1.8742	0 32 19.5	12.858
3	11 27 13.84	1.8631	9 9 33.1	11.654	3	12 56 22.70	1.8761	0 45 11.2	12.867
4	11 29 5.59	1.8619	8 57 52.6	11.696	4	12 58 15.32	1.8780	0 58 3.5	12.875
5	11 30 57.27	1.8608	8 46 9.6	11.737	5	13 0 8.06	1.8799	1 10 56.2	12.883
6	11 32 48.88	1.8597	8 34 24.2	11.776	6	13 2 0.91	1.8819	1 23 49.4	12.890
7	11 34 40.43	1.8587	8 22 36.5	11.814	7	13 3 53.89	1.8841	1 36 43.0	12.896
8	11 36 31.93	1.8578	8 10 46.5	11.853	8	13 5 47.00	1.8863	1 49 36.9	12.901
9	11 38 23.37	1.8569	7 58 54.2	11.891	9	13 7 40.25	1.8886	2 2 31.1	12.906
10	11 40 14.76	1.8561	7 46 59.6	11.927	10	13 9 33.64	1.8910	2 15 25.6	12.909
11	11 42 6.10	1.8553	7 35 2.9	11.963	11	13 11 27.17	1.8934	2 28 20.2	12.912
12	11 43 57.39	1.8545	7 23 4.0	11.999	12	13 13 20.84	1.8958	2 41 15.0	12.914
13	11 45 48.64	1.8539	7 11 3.0	12.034	13	13 15 14.67	1.8985	2 54 9.9	12.916
14	11 47 39.86	1.8533	6 58 59.9	12.068	14	13 17 8.66	1.9012	3 7 4.9	12.917
15	11 49 31.04	1.8528	6 46 54.8	12.102	15	13 19 2.81	1.9039	3 19 59.9	12.916
16	11 51 22.19	1.8523	6 34 47.7	12.135	16	13 20 57.12	1.9066	3 32 54.8	12.915
17	11 53 13.32	1.8519	6 22 38.6	12.167	17	13 22 51.60	1.9095	3 45 49.7	12.913
18	11 55 4.42	1.8515	6 10 27.6	12.199	18	13 24 46.26	1.9125	3 58 44.4	12.910
19	11 56 55.50	1.8512	5 58 14.7	12.230	19	13 26 41.10	1.9155	4 11 38.9	12.907
20	11 58 46.57	1.8510	5 46 0.0	12.261	20	13 28 36.12	1.9186	4 24 33.2	12.903
21	12 0 37.62	1.8508	5 33 43.4	12.291	21	13 30 31.33	1.9217	4 37 27.3	12.898
22	12 2 28.67	1.8507	5 21 25.1	12.319	22	13 32 26.73	1.9250	4 50 21.0	12.892
23	12 4 19.71	1.8507	N. 5 9 5.1	12.348	23	13 34 22.33	1.9283	S. 5 3 14.3	12.884
TUESDAY 22.					THURSDAY 24.				
0	h m s 12 6 10.75	1.8507	N. 4 56 43.4	12.376	0	h m s 13 36 18.13	1.9317	S. 5 16 7.1	12.876
1	12 8 1.79	1.8508	4 44 20.0	12.403	1	13 38 14.14	1.9352	5 28 59.4	12.867
2	12 9 52.84	1.8509	4 31 55.1	12.428	2	13 40 10.36	1.9388	5 41 51.2	12.858
3	12 11 43.90	1.8510	4 19 28.6	12.454	3	13 42 6.80	1.9425	5 54 42.4	12.848
4	12 13 34.97	1.8513	4 7 0.6	12.479	4	13 44 3.46	1.9462	6 7 33.0	12.837
5	12 15 26.06	1.8517	3 54 31.1	12.504	5	13 46 0.34	1.9499	6 20 22.9	12.825
6	12 17 17.17	1.8521	3 42 0.1	12.528	6	13 47 57.45	1.9537	6 33 12.0	12.813
7	12 19 8.31	1.8526	3 29 27.7	12.551	7	13 49 54.79	1.9577	6 46 0.3	12.797
8	12 20 59.48	1.8531	3 16 54.0	12.574	8	13 51 52.38	1.9618	6 58 47.7	12.782
9	12 22 50.68	1.8537	3 4 18.9	12.596	9	13 53 50.21	1.9659	7 11 34.1	12.765
10	12 24 41.92	1.8543	2 51 42.5	12.617	10	13 55 48.29	1.9701	7 24 19.5	12.748
11	12 26 33.20	1.8551	2 39 4.9	12.636	11	13 57 46.62	1.9743	7 37 3.9	12.731
12	12 28 24.53	1.8559	2 26 26.2	12.655	12	13 59 45.21	1.9787	7 49 47.3	12.713
13	12 30 15.91	1.8568	2 13 46.3	12.674	13	14 1 44.06	1.9831	8 2 29.5	12.692
14	12 32 7.34	1.8577	2 1 5.3	12.693	14	14 3 43.18	1.9876	8 15 10.4	12.671
15	12 33 58.83	1.8587	1 48 23.2	12.711	15	14 5 42.57	1.9921	8 27 50.0	12.649
16	12 35 50.38	1.8597	1 35 40.0	12.728	16	14 7 42.23	1.9968	8 40 28.3	12.627
17	12 37 42.00	1.8608	1 22 55.8	12.745	17	14 9 42.18	2.0015	8 53 5.2	12.603
18	12 39 33.68	1.8620	1 10 10.6	12.761	18	14 11 42.41	2.0063	9 5 40.6	12.578
19	12 41 25.44	1.8633	0 57 24.5	12.775	19	14 13 42.93	2.0112	9 18 14.5	12.552
20	12 43 17.28	1.8647	0 44 37.6	12.788	20	14 15 43.75	2.0162	9 30 46.8	12.524
21	12 45 9.20	1.8661	0 31 49.9	12.801	21	14 17 44.87	2.0212	9 43 17.4	12.496
22	12 47 1.21	1.8676	0 19 1.4	12.814	22	14 19 46.29	2.0262	9 55 46.3	12.467
23	12 48 53.31	1.8691	N. 0 6 12.2	12.826	23	14 21 48.01	2.0313	10 8 13.4	12.436
24	12 50 45.50	1.8707	S. 0 6 37.7	12.837	24	14 23 50.04	2.0365	S. 10 20 38.6	12.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	14 23 50.04	2.0365	S. 10° 20' 38".6	12.404	0	16 8 55.07	2.3690	S. 19° 15' 27".4	9.399
1	14 25 52.39	2.0419	10 33 1.9	12.372	1	16 11 17.08	2.3707	19 24 44.1	9.327
2	14 27 55.07	2.0473	10 45 23.2	12.338	2	16 13 39.56	2.3726	19 33 54.7	9.194
3	14 29 58.07	2.0528	10 57 42.5	12.303	3	16 16 2.51	2.3865	19 42 59.0	9.019
4	14 32 1.40	2.0583	11 9 59.6	12.267	4	16 18 25.94	2.3944	19 51 57.0	8.912
5	14 34 5.07	2.0640	11 22 14.5	12.229	5	16 20 49.84	2.4029	20 0 48.5	8.803
6	14 36 9.08	2.0697	11 34 27.1	12.191	6	16 23 14.21	2.4101	20 9 33.4	8.693
7	14 38 13.43	2.0754	11 46 37.4	12.152	7	16 25 39.05	2.4179	20 18 11.7	8.582
8	14 40 18.13	2.0819	11 58 45.3	12.110	8	16 28 4.26	2.4257	20 26 43.2	8.468
9	14 42 23.18	2.0872	12 10 50.6	12.068	9	16 30 30.14	2.4336	20 35 7.9	8.353
10	14 44 28.59	2.0932	12 22 53.4	12.025	10	16 32 56.39	2.4414	20 43 25.6	8.236
11	14 46 34.36	2.0992	12 34 53.6	11.981	11	16 35 23.11	2.4493	20 51 36.2	8.117
12	14 48 40.49	2.1053	12 46 51.1	11.935	12	16 37 50.30	2.4571	20 59 39.6	7.996
13	14 50 46.99	2.1115	12 58 45.8	11.887	13	16 40 17.96	2.4648	21 7 35.7	7.874
14	14 52 53.87	2.1177	13 10 37.6	11.838	14	16 42 46.08	2.4725	21 15 24.5	7.751
15	14 55 1.12	2.1240	13 22 26.4	11.788	15	16 45 14.66	2.4803	21 23 5.8	7.625
16	14 57 8.75	2.1304	13 34 12.2	11.737	16	16 47 43.71	2.4880	21 30 39.5	7.498
17	14 59 16.77	2.1369	13 45 54.9	11.685	17	16 50 13.22	2.4956	21 38 5.6	7.369
18	15 1 25.18	2.1434	13 57 34.4	11.632	18	16 52 43.18	2.5039	21 45 23.8	7.238
19	15 3 33.98	2.1500	14 9 10.7	11.577	19	16 55 13.60	2.5107	21 52 34.1	7.106
20	15 5 43.18	2.1567	14 20 43.6	11.520	20	16 57 44.47	2.5189	21 59 36.5	6.972
21	15 7 52.78	2.1634	14 32 13.1	11.462	21	17 0 15.79	2.5257	22 6 30.8	6.836
22	15 10 2.78	2.1701	14 43 39.0	11.409	22	17 2 47.55	2.5331	22 13 16.9	6.698
23	15 12 13.19	2.1770	S. 14° 55' 1.3	11.349	23	17 5 19.76	2.5405	S. 22° 19' 54.6	6.558
SATURDAY 26.					MONDAY 28.				
0	15 14 24.02	2.1839	S. 15° 6' 20.0	11.280	0	17 7 52.41	2.5478	S. 22° 26' 23.9	6.418
1	15 16 35.26	2.1908	15 17 34.9	11.216	1	17 10 25.50	2.5551	22 32 44.7	6.276
2	15 18 46.92	2.1978	15 28 45.9	11.151	2	17 12 59.02	2.5622	22 38 57.0	6.139
3	15 20 59.00	2.2049	15 39 53.0	11.085	3	17 15 32.96	2.5693	22 45 0.5	5.995
4	15 23 11.51	2.2120	15 50 56.1	11.017	4	17 18 7.33	2.5763	22 50 55.2	5.838
5	15 25 24.44	2.2191	16 1 55.0	10.947	5	17 20 42.12	2.5839	22 56 41.1	5.690
6	15 27 37.80	2.2264	16 12 49.7	10.876	6	17 23 17.32	2.5901	23 2 18.0	5.539
7	15 29 51.60	2.2337	16 23 40.1	10.803	7	17 25 52.93	2.5969	23 7 45.8	5.387
8	15 32 5.84	2.2410	16 34 26.1	10.729	8	17 28 28.95	2.6037	23 13 4.4	5.233
9	15 34 20.52	2.2483	16 45 7.6	10.653	9	17 31 5.37	2.6103	23 18 13.8	5.079
10	15 36 35.64	2.2557	16 55 44.5	10.577	10	17 33 42.18	2.6167	23 23 13.9	4.922
11	15 38 51.20	2.2631	17 6 16.8	10.498	11	17 36 19.37	2.6230	23 28 4.4	4.762
12	15 41 7.21	2.2706	17 16 44.3	10.418	12	17 38 56.94	2.6293	23 32 45.3	4.609
13	15 43 23.67	2.2782	17 27 6.9	10.336	13	17 41 34.89	2.6356	23 37 16.6	4.449
14	15 45 40.59	2.2857	17 37 24.6	10.253	14	17 44 18.21	2.6418	23 41 38.3	4.289
15	15 47 57.96	2.2933	17 47 37.2	10.168	15	17 46 51.88	2.6475	23 45 50.2	4.116
16	15 50 15.79	2.3010	17 57 44.7	10.081	16	17 49 30.91	2.6534	23 49 52.2	3.950
17	15 52 34.08	2.3086	18 7 46.9	9.992	17	17 52 10.29	2.6599	23 53 44.2	3.783
18	15 54 52.82	2.3163	18 17 43.8	9.902	18	17 54 50.01	2.6648	23 57 26.2	3.616
19	15 57 12.03	2.3240	18 27 35.2	9.811	19	17 57 30.07	2.6709	24 0 58.1	3.447
20	15 59 31.70	2.3318	18 37 21.1	9.718	20	18 0 10.44	2.6754	24 4 19.8	3.276
21	16 1 51.84	2.3396	18 47 1.4	9.623	21	18 2 51.12	2.6806	24 7 31.2	3.104
22	16 4 12.45	2.3474	18 56 35.9	9.527	22	18 5 32.11	2.6857	24 10 32.3	2.939
23	16 6 33.53	2.3552	19 6 4.6	9.429	23	18 8 13.41	2.6907	24 13 23.0	2.758
24	16 8 55.07	2.3639	S. 19° 15' 27.4	9.329	24	18 10 55.00	2.6955	S. 24° 16' 3.2	2.582

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 29.					THURSDAY 31.				
0	18 10 55.00	2.6865	S. 24° 16' 3.2	2.588	0	20 22 35.07	2.7226	S. 22° 47' 16.3	6.379
1	18 13 36.87	2.7001	24 18 32.8	2.405	1	20 25 18.32	2.7190	22 40 54.3	6.453
2	18 16 19.01	2.7046	24 20 51.8	2.926	2	20 28 1.35	2.7152	22 34 21.9	6.626
3	18 19 1.42	2.7089	24 23 0.2	2.051	3	20 30 44.15	2.7113	22 27 39.2	6.797
4	18 21 44.08	2.7130	24 24 57.9	1.873	4	20 33 26.71	2.7073	22 20 46.2	6.968
5	18 24 26.98	2.7170	24 26 44.8	1.693	5	20 36 9.03	2.7033	22 13 43.0	7.138
6	18 27 10.12	2.7309	24 28 20.9	1.511	6	20 38 51.09	2.6998	22 6 29.6	7.307
7	18 29 53.49	2.7346	21 29 46.1	1.328	7	20 41 32.89	2.6944	21 59 6.2	7.473
8	18 32 37.07	2.7381	24 31 0.3	1.145	8	20 44 14.42	2.6898	21 51 32.9	7.638
9	18 35 20.86	2.7314	21 32 3.5	0.963	9	20 46 55.67	2.6852	21 43 49.7	7.802
10	18 38 4.84	2.7346	24 32 55.7	0.778	10	20 49 36.64	2.6804	21 35 56.7	7.964
11	18 40 49.01	2.7377	24 33 36.9	0.593	11	20 52 17.32	2.6755	21 27 54.0	8.126
12	18 43 33.36	2.7405	24 34 6.9	0.407	12	20 54 57.70	2.6705	21 19 41.7	8.284
13	18 46 17.87	2.7431	24 34 25.8	0.222	13	20 57 37.78	2.6653	21 11 19.9	8.442
14	18 49 2.53	2.7456	24 34 33.5	- 0.036	14	21 0 17.54	2.6600	21 2 48.7	8.598
15	18 51 47.34	2.7479	24 34 30.1	+ 0.151	15	21 2 56.98	2.6547	20 54 8.2	8.752
16	18 54 32.28	2.7500	24 34 15.4	0.339	16	21 5 36.10	2.6493	20 45 18.5	8.904
17	18 57 17.34	2.7530	24 33 49.4	0.527	17	21 8 14.90	2.6438	20 36 19.7	9.054
18	19 0 2.52	2.7536	21 33 12.1	0.716	18	21 10 53.36	2.6388	20 27 12.0	9.209
19	19 2 47.80	2.7553	21 32 23.5	0.904	19	21 13 31.48	2.6335	20 17 55.4	9.350
20	19 5 33.16	2.7567	24 31 23.6	1.093	20	21 16 9.26	2.6287	20 8 30.0	9.497
21	19 8 18.60	2.7579	24 30 12.4	1.289	21	21 18 46.69	2.6239	19 58 55.8	9.641
22	19 11 4.11	2.7589	24 28 49.8	1.473	22	21 21 23.77	2.6151	19 49 13.1	9.782
23	19 13 49.67	2.7597	S. 24° 27' 15.8	1.661	23	21 24 0.50	2.6092	S. 19° 39' 22.0	9.922
WEDNESDAY 30.					FRIDAY, AUGUST 1.				
0	19 16 35.28	2.7604	S. 24° 25' 30.5	1.850	0	21 26 36.87	2.6031	S. 19° 29' 22.5	10.060
1	19 19 20.92	2.7608	24 23 33.8	2.039	PHASES OF THE MOON.				
2	19 22 6.58	2.7612	24 21 25.8	2.226					
3	19 24 52.26	2.7613	24 19 6.4	2.418					
4	19 27 37.94	2.7612	24 16 35.6	2.607					
5	19 30 23.61	2.7609	24 13 53.5	2.796					
6	19 33 9.25	2.7604	24 11 0.1	2.984					
7	19 35 54.86	2.7598	24 7 55.4	3.173					
8	19 38 40.43	2.7591	24 4 39.4	3.361					
9	19 41 25.95	2.7581	24 1 12.1	3.548					
10	19 44 11.40	2.7568	23 57 33.6	3.735					
11	19 46 56.77	2.7555	23 53 43.9	3.922					
12	19 49 42.06	2.7540	23 49 43.0	4.107					
13	19 52 27.25	2.7522	23 45 31.0	4.293					
14	19 55 12.33	2.7504	23 41 7.9	4.477					
15	19 57 57.30	2.7484	23 36 33.7	4.663					
16	20 0 42.14	2.7463	23 31 48.5	4.845					
17	20 3 26.84	2.7438	23 26 52.3	5.027					
18	20 6 11.39	2.7413	23 21 45.2	5.209					
19	20 8 55.79	2.7386	23 16 27.2	5.390					
20	20 11 40.02	2.7357	23 10 58.4	5.569					
21	20 14 24.07	2.7327	23 5 18.9	5.748					
22	20 17 7.94	2.7295	22 59 28.7	5.926					
23	20 19 51.61	2.7261	22 53 27.8	6.103					
24	20 22 35.07	2.7226	S. 22° 47' 16.3	6.279					

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1	Spica W.	61° 55' 4"	9198	63° 45' 21"	9116	65° 35' 55"	9105	67° 26' 47"	9085
	JUPITER E.	46 25 57	9077	44 34 22	9066	42 42 31	9057	40 50 26	9049
	Fomalhaut E.	69 38 2	9295	67 51 55	9299	66 5 40	9295	64 19 19	9293
	α Pegasi E.	87 53 9	9508	86 12 7	9499	84 30 52	9491	82 49 26	9485
2	Spica W.	76 44 44	9054	78 36 54	9048	80 29 14	9043	82 21 41	9039
	Antares W.	30 58 34	9108	32 49 21	9094	34 40 29	9083	36 31 54	9073
	Fomalhaut E.	55 27 23	9294	53 41 15	9292	51 55 19	9292	50 9 37	9298
	α Pegasi E.	74 20 54	9480	72 39 12	9483	70 57 35	9489	69 16 6	9497
	α Arietis E.	116 51 2	9189	115 2 8	9179	113 12 58	9163	111 23 35	9155
3	Spica W.	91 45 8	9030	93 37 55	9031	95 30 42	9033	97 23 26	9035
	Antares W.	45 52 4	9045	47 44 28	9043	49 36 55	9049	51 29 24	9049
	Fomalhaut E.	41 27 30	9449	39 44 57	9480	38 3 16	9593	36 22 35	9574
	α Pegasi E.	60 52 39	9574	59 13 8	9598	57 34 10	9595	55 55 48	9555
	α Arietis E.	102 14 17	9134	100 24 10	9133	98 34 0	9123	96 43 51	9134
4	Spica W.	106 45 47	9057	108 37 52	9064	110 29 46	9072	112 21 28	9080
	Antares W.	60 51 19	9056	62 43 27	9061	64 35 27	9066	66 27 18	9073
	α Pegasi E.	47 56 3	9276	46 23 13	9296	44 51 40	9305	43 21 33	9303
	α Arietis E.	67 33 57	9153	65 44 19	9160	63 54 51	9169	62 5 35	9176
	Aldebaran E.	118 22 5	9039	116 29 32	9045	114 37 8	9051	112 44 53	9058
	Sun E.	138 53 41	9383	137 9 42	9394	135 25 58	9405	133 42 31	9418
5	Antares W.	75 43 39	9116	77 34 14	9126	79 24 33	9137	81 14 36	9149
	α Arietis E.	73 2 55	9233	71 15 16	9247	69 27 58	9261	67 41 1	9277
	Aldebaran E.	103 26 43	9103	101 35 48	9114	99 45 9	9126	97 54 47	9137
	Sun E.	138 53 41	9383	137 9 42	9394	135 25 58	9405	133 42 31	9418
6	Antares W.	90 20 16	9212	92 8 25	9226	93 56 14	9241	95 43 41	9255
	α Aquilæ W.	50 38 50	9596	51 58 1	9514	53 18 10	9466	54 30 12	9495
	JUPITER W.	29 7 6	9189	30 56 0	9195	32 44 37	9208	34 32 54	9220
	α Arietis E.	58 52 26	9269	57 8 6	9289	55 24 16	9219	53 40 59	9235
	Aldebaran E.	88 47 32	9200	86 59 4	9213	85 10 56	9227	83 23 10	9241
	Sun E.	125 9 52	9486	123 28 19	9500	121 47 6	9515	120 6 15	9531
	Sun E.	125 9 52	9486	123 28 19	9500	121 47 6	9515	120 6 15	9531
7	Antares W.	104 35 30	9231	106 20 45	9247	108 5 36	9263	109 50 4	9279
	α Aquilæ W.	61 34 2	9293	62 58 22	9277	64 23 0	9285	65 47 52	9295
	JUPITER W.	43 29 34	9267	45 15 53	9301	47 1 51	9316	48 47 29	9331
	α Arietis E.	45 13 28	9575	43 33 58	9599	41 55 15	9545	40 17 19	9583
	Aldebaran E.	74 29 47	9317	72 44 13	9339	70 59 2	9346	69 14 14	9364
	Sun E.	111 47 23	9619	110 8 43	9636	108 30 26	9645	106 52 31	9661
	Sun E.	111 47 23	9619	110 8 43	9636	108 30 26	9645	106 52 31	9661
8	α Aquilæ W.	72 54 12	9239	74 19 35	9241	75 44 56	9244	77 10 13	9249
	JUPITER W.	57 30 6	9405	59 13 33	9420	60 56 40	9435	62 39 26	9450
	Fomalhaut W.	37 33 38	9293	39 5 28	9293	40 37 43	9288	42 10 17	9276
	Aldebaran E.	60 35 57	9445	58 53 26	9461	57 11 17	9477	55 29 32	9493
	Sun E.	98 48 33	9744	97 12 52	9760	95 37 34	9777	94 2 37	9794
9	α Aquilæ W.	84 14 43	9391	85 39 5	9392	87 3 14	9314	88 27 9	9327
	JUPITER W.	71 7 56	9523	72 48 37	9538	74 28 58	9552	76 8 59	9566
	Fomalhaut W.	49 55 44	9255	51 29 1	9256	53 2 16	9258	54 35 29	9261
	α Pegasi W.	37 19 46	9691	38 33 15	9610	39 48 7	9742	41 4 10	9809

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1	Spica W.	69° 17' 55"	9065	71° 9' 18"	9076	73° 0' 54"	9086	74° 52' 43"	9081
	Jupiter E.	38 58 8	9041	37 5 38	9036	35 12 58	9009	33 20 9	9094
	Fomalhaut E.	62 32 55	9063	60 46 27	9063	59 0 2	9066	57 13 40	9066
	α Pegasi E.	81 7 52	9481	79 26 12	9478	77 44 27	9476	76 2 40	9477
2	Spica W.	84 14 14	9036	86 6 53	9033	87 59 36	9030	89 52 21	9031
	Antares W.	38 23 35	9036	40 15 28	9058	42 7 32	9056	43 59 45	9048
	Fomalhaut E.	48 24 14	9343	46 39 15	9363	44 54 45	9363	43 10 48	9408
	α Pegasi E.	67 34 49	9508	65 53 47	9500	64 13 2	9536	62 32 37	9554
	α Arietis E.	109 33 59	9149	107 44 14	9143	105 54 21	9139	104 4 21	9136
3	Spica W.	99 16 6	9038	101 8 41	9043	103 1 11	9046	104 53 33	9061
	Antares W.	53 21 53	9043	55 14 20	9045	57 6 44	9048	58 59 5	9052
	Fomalhaut E.	48 24 14	9343	46 39 15	9363	44 54 45	9363	43 10 48	9408
	α Pegasi E.	67 34 49	9508	65 53 47	9500	64 13 2	9536	62 32 37	9554
	α Arietis E.	109 33 59	9149	107 44 14	9143	105 54 21	9139	104 4 21	9136
4	Spica W.	114 12 57	9069	116 4 13	9069	117 55 13	9111	119 45 57	9104
	Antares W.	68 18 59	9061	70 10 28	9066	72 1 46	9067	73 52 50	9107
	α Pegasi E.	41 53 3	9170	40 26 18	9166	39 1 29	9179	37 38 49	9166
	α Arietis E.	80 16 32	9186	78 27 43	9186	76 39 10	9207	74 50 53	9200
	Aldebaran E.	110 52 50	9066	109 0 58	9074	107 9 19	9063	105 17 53	9063
5	Antares W.	83 4 21	9161	84 53 48	9173	86 42 56	9185	88 31 46	9196
	α Arietis E.	65 54 27	9206	64 8 17	9207	62 22 33	9206	60 37 15	9248
	Aldebaran E.	96 4 42	9148	94 14 56	9160	92 25 28	9173	90 36 20	9186
	Sun E.	131 59 22	9431	130 16 31	9443	128 33 58	9456	126 51 45	9471
6	Antares W.	97 30 47	9270	99 17 31	9284	101 3 54	9290	102 49 53	9315
	α Aquilæ W.	56 1 0	9390	57 23 28	9380	58 46 30	9334	60 10 4	9312
	Jupiter W.	36 20 52	9232	38 8 32	9246	39 55 53	9200	41 42 54	9273
	α Arietis E.	51 58 14	9461	50 16 6	9467	48 34 34	9514	46 53 40	9544
	Aldebaran E.	81 35 45	9266	79 48 40	9271	78 1 59	9266	76 15 41	9301
	Sun E.	118 25 45	9547	116 45 37	9563	115 5 50	9579	113 26 25	9586
7	Antares W.	111 34 9	9385	113 17 51	9411	115 1 10	9428	116 44 5	9443
	α Aquilæ W.	67 12 55	9348	68 38 7	9349	70 3 26	9340	71 28 48	9336
	Jupiter W.	50 32 43	9346	52 17 36	9300	54 2 7	9375	55 46 17	9390
	α Arietis E.	38 40 16	9725	37 4 9	9770	35 29 2	9819	33 54 59	9874
	Aldebaran E.	67 29 49	9380	65 45 46	9396	64 2 7	9412	62 18 50	9498
	Sun E.	105 14 58	9678	103 37 48	9694	102 1 1	9711	100 24 36	9737
8	α Aquilæ W.	78 35 24	9355	80 0 28	9363	81 25 23	9371	82 50 8	9380
	Jupiter W.	64 21 50	9405	66 3 53	9400	67 45 34	9405	69 26 56	9400
	Fomalhaut W.	43 43 6	9667	45 16 7	9662	46 49 15	9650	48 22 29	9656
	Aldebaran E.	53 48 9	9500	52 7 8	9503	50 26 30	9539	48 46 13	9556
	Sun E.	92 28 2	9611	90 53 49	9606	89 19 57	9644	87 46 26	9660
9	α Aquilæ W.	89 50 49	9348	91 14 12	9367	92 37 18	9379	94 0 7	9389
	Jupiter W.	77 48 41	9506	79 28 4	9504	81 7 8	9506	82 45 54	9501
	Fomalhaut W.	56 8 38	9606	57 41 41	9671	59 14 38	9677	60 47 28	9683
	α Pegasi W.	42 21 16	9667	43 39 21	9681	44 58 16	9641	46 17 55	9666

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9	Aldebaran	E.	40° 30' 21"	9826	38° 52' 15"	9859	37° 14' 32"	9888	35° 37' 8"	9894
	Sun	E.	80 3 59	9939	78 32 29	9954	77 1 18	9989	75 30 26	9983
10	α Aquilæ	W.	100 49 10	3483	102 9 53	3505	103 30 12	3527	104 50 6	3549
	JUPITER	W.	90 55 18	9884	92 32 20	9885	94 9 6	9707	95 45 37	9719
	Fomalhaut	W.	68 29 32	9918	70 1 28	9926	71 33 14	9934	73 4 49	9943
	α Pegasi	W.	53 4 13	3391	54 26 40	3375	55 49 25	3364	57 12 23	3354
	Aldebaran	E.	27 35 43	9769	26 0 35	9789	24 25 52	9809	22 51 33	9829
	Sun	E.	68 0 34	3053	66 31 27	3088	65 2 36	3079	63 34 2	3099
11	JUPITER	W.	103 44 26	9773	105 19 29	9789	106 54 19	9799	108 28 56	9809
	Fomalhaut	W.	80 40 4	9986	82 10 34	9995	83 40 53	9994	85 11 1	9913
	α Pegasi	W.	64 9 34	3394	65 33 18	3381	66 57 5	3390	68 20 53	3319
	Sun	E.	56 14 58	3153	54 47 53	3165	53 21 1	3178	51 54 22	3187
12	JUPITER	W.	116 18 57	9648	117 52 22	9656	119 25 37	9668	120 58 40	9673
	Fomalhaut	W.	92 38 51	3058	94 7 52	3068	95 36 41	3077	97 5 19	3068
	α Pegasi	W.	75 19 56	3395	76 43 39	3387	78 7 19	3390	79 30 56	3334
	Sun	E.	44 44 20	3038	43 18 56	3048	41 53 43	3056	40 28 41	3067
13	Fomalhaut	W.	104 25 41	3133	105 53 11	3143	107 20 29	3153	108 47 36	3163
	α Pegasi	W.	86 27 46	3368	87 50 50	3364	89 13 48	3371	90 36 38	3376
	Sun	E.	33 26 12	3310	32 2 12	3319	30 38 23	3328	29 14 44	3337
18	Sun	W.	21 46 18	3475	23 7 10	3471	24 28 7	3468	25 49 7	3464
	Spica	E.	64 57 23	3113	63 29 29	3113	62 1 35	3114	60 33 42	3114
	Antares	E.	110 51 20	3103	109 23 15	3109	107 55 8	3101	106 27 0	3106
19	Sun	W.	32 35 3	3448	33 56 25	3445	35 17 51	3441	36 39 21	3437
	Spica	E.	53 14 19	3113	51 46 25	3113	50 18 31	3113	48 50 37	3119
	Antares	E.	99 5 54	3091	97 37 33	3090	96 9 10	3087	94 40 42	3084
20	Sun	W.	43 28 3	3414	44 50 4	3408	46 12 11	3408	47 34 25	3398
	Spica	E.	41 30 54	3109	40 2 55	3109	38 34 56	3109	37 6 56	3109
	Antares	E.	87 17 28	3085	85 48 35	3080	84 19 35	3055	82 50 30	3050
21	Sun	W.	54 27 24	3361	55 50 25	3359	57 13 36	3344	58 36 57	3335
	Regulus	W.	25 29 10	3089	26 58 12	3045	28 27 32	3031	29 57 8	3018
	Spica	E.	29 47 15	3119	28 19 30	3124	26 51 50	3130	25 24 17	3140
	Antares	E.	75 23 22	3019	73 53 33	3019	72 23 35	3005	70 53 28	9997
22	Sun	W.	65 36 22	3285	67 0 51	3274	68 25 33	3269	69 50 28	3250
	Regulus	W.	37 28 55	2986	39 0 3	2944	40 31 25	2939	42 3 3	2990
	VENUS	W.	27 33 6	3389	28 55 24	3384	30 17 59	3380	31 40 49	3354
	Antares	E.	63 20 24	2984	61 49 14	2945	60 17 52	2936	58 46 18	2926
23	Sun	W.	76 58 48	3184	78 25 16	3170	79 52 1	3155	81 19 4	3140
	Regulus	W.	49 45 21	2953	51 18 40	2939	52 52 18	2925	54 26 15	2910
	VENUS	W.	38 39 20	3380	40 3 55	3364	41 28 49	3348	42 54 2	3331
	Antares	E.	51 5 11	2971	49 32 15	2936	47 59 5	2949	46 25 40	2937
	α Aquilæ	E.	98 19 54	3580	97 0 58	3563	95 41 43	3545	94 22 9	2948
	JUPITER	E.	110 8 18	2785	108 33 43	2789	106 58 52	2789	105 23 42	2755

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24	SUN W.	82° 46' 24"	3125	84° 14' 3"	3109	85° 42' 1"	3093	87° 10' 19"	3077
	Regulus W.	56 0 29	3795	57 35 4	3780	59 9 58	3764	60 45 13	3748
	VENUS W.	44 19 33	3914	45 45 25	3197	47 11 36	3180	48 38 8	3163
	Antares E.	44 52 1	3825	43 18 6	3814	41 43 56	3803	40 9 30	3791
	α Aquilæ E.	93 2 16	3519	91 42 5	3498	90 21 36	3480	89 0 50	3466
	JUPITER E.	103 48 14	3745	102 12 28	3736	100 36 22	3711	98 59 56	3696
25	SUN W.	94 36 57	3990	96 7 22	3979	97 38 9	3964	99 9 19	3935
	Regulus W.	68 46 45	3606	70 24 10	3649	72 1 59	3639	73 40 11	3614
	VENUS W.	55 56 9	3073	57 24 52	3054	58 53 59	3035	60 23 29	3016
	Antares E.	32 13 43	3739	30 37 55	3730	29 1 55	3722	27 25 44	3719
	α Aquilæ E.	82 13 13	3405	80 51 2	3394	79 28 39	3386	78 6 6	3378
	JUPITER E.	90 52 36	3615	89 14 2	3599	87 35 5	3589	85 55 46	3565
26	SUN W.	106 51 9	3940	108 24 45	3921	109 58 46	3901	111 33 12	3799
	Regulus W.	81 57 14	3594	83 37 54	3598	85 19 0	3488	87 0 31	3469
	VENUS W.	67 57 6	3016	69 29 5	3006	71 1 30	2976	72 34 21	2956
	Spica W.	28 22 3	3635	30 0 11	3605	31 38 59	3576	33 18 27	3549
	α Aquilæ E.	71 11 31	3356	69 48 24	3357	68 25 18	3359	67 2 14	3363
	JUPITER E.	77 33 6	3476	75 51 19	3457	74 9 7	3439	72 26 29	3421
27	SUN W.	119 31 50	3984	121 8 51	3965	122 46 18	3946	124 24 11	3927
	Regulus W.	95 34 39	3277	97 18 47	3259	99 3 22	3241	100 48 24	3222
	VENUS W.	80 25 9	3753	82 0 38	3733	83 36 33	3713	85 12 56	3693
	Spica W.	41 44 44	3497	43 27 40	3465	45 11 7	3433	46 55 6	3402
	α Aquilæ E.	60 9 2	3493	58 47 11	3445	57 25 45	3470	56 4 47	3501
	JUPITER E.	63 46 51	3231	62 1 37	3213	60 15 56	3195	58 29 50	3177
	Fomalhaut E.	89 9 4	3549	87 28 50	3594	85 48 10	3507	84 7 6	3490
	α Pegasi E.	106 24 27	3613	104 50 16	3787	103 15 31	3763	101 40 14	3739
28	VENUS W.	93 21 20	3599	95 0 17	3581	96 39 40	3563	98 19 27	3545
	Spica W.	55 42 29	3263	57 29 23	3245	59 16 44	3227	61 4 32	3209
	JUPITER E.	49 32 50	3192	47 44 11	3176	45 55 8	3161	44 5 41	3145
	Fomalhaut E.	75 36 5	3414	73 52 49	3401	72 9 15	3388	70 25 23	3376
	α Pegasi E.	93 36 25	3635	91 58 18	3618	90 19 47	3601	88 40 53	3586
29	Spica W.	70 9 47	3131	71 59 59	3116	73 50 33	3103	75 41 28	3090
	Antares W.	24 30 25	3294	26 18 17	3196	28 6 51	3179	29 56 1	3149
	JUPITER E.	34 52 55	3077	33 1 21	3067	31 9 30	3058	29 17 23	3049
	Fomalhaut E.	61 42 22	3235	59 57 14	3231	58 11 59	3228	56 26 41	3227
	α Pegasi E.	80 21 39	3596	78 41 2	3518	77 0 14	3512	75 19 18	3507
30	Spica W.	85 0 36	3037	86 53 12	3028	88 46 2	3021	90 39 4	3014
	Antares W.	39 9 31	3064	41 1 26	3059	42 53 40	3049	44 46 12	3030
	Fomalhaut E.	47 40 50	3257	45 56 13	3271	44 11 57	3290	42 28 8	3419
	α Pegasi E.	66 53 47	3519	65 12 50	3519	63 32 3	3509	61 51 30	3540
	α Arietis E.	108 49 16	3147	106 59 29	3136	105 9 25	3126	103 19 6	3117
31	Spica W.	100 6 29	1992	102 0 16	1990	103 54 6	1989	105 47 57	1989
	Antares W.	54 12 9	1996	56 5 49	1993	57 59 35	1990	59 53 25	1988
	α Pegasi E.	53 34 26	3053	51 56 43	3068	50 19 47	3079	48 43 45	3075
	α Arietis E.	94 4 37	3098	92 13 20	3098	90 21 59	3085	88 30 36	3094

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24	SUN W.	88° 38' 57"	3000	90° 7' 55"	3043	91° 37' 14"	3096	93° 6' 55"	3008
	Regulus W.	62 20 48	9732	63 56 45	9716	65 33 3	9700	67 9 43	9683
	VENUS W.	50 5 1	3146	51 32 15	3198	52 59 50	3110	54 27 48	3091
	Antares E.	38 34 50	9779	36 59 55	9768	35 24 45	9757	33 49 21	9747
	α Aquilæ E.	87 39 48	3453	86 18 31	3439	84 56 59	3426	83 35 12	3415
	JUPITER E.	97 23 10	2681	95 46 4	2665	94 8 36	2649	92 30 47	2633
25	SUN W.	100 40 53	2916	102 12 51	2998	103 45 12	2979	105 17 58	2959
	Regulus W.	75 18 46	2506	76 57 46	2578	78 37 11	2560	80 17 0	2542
	VENUS W.	61 53 23	2996	63 23 41	2976	64 54 25	2956	66 25 33	2936
	Antares E.	25 49 30	9719	24 13 15	9719	22 37 0	9719	21 0 46	9719
	α Aquilæ E.	76 43 24	3371	75 20 34	3365	73 57 37	3361	72 34 36	3356
	JUPITER E.	84 16 2	2548	82 35 55	2530	80 55 23	2512	79 14 27	2494
26	SUN W.	113 8 4	2792	114 43 22	2743	116 19 5	2722	117 55 15	2704
	Regulus W.	88 42 28	2450	90 24 51	2432	92 7 41	2414	93 50 57	2396
	VENUS W.	74 7 37	2635	75 41 20	2615	77 15 30	2595	78 50 6	2574
	Spica W.	34 58 32	2623	36 39 13	2498	38 20 29	2473	40 2 20	2450
	α Aquilæ E.	65 39 15	3390	64 16 23	3379	62 53 42	3360	61 31 13	3405
	JUPITER E.	70 43 26	2403	68 59 56	2365	67 16 1	2367	65 31 39	2349
27	SUN W.	126 2 29	2608	127 41 13	2590	129 20 22	2572	130 59 56	2554
	Regulus W.	102 33 51	2304	104 19 44	2286	106 6 4	2270	107 52 48	2252
	VENUS W.	86 49 44	2673	88 27 0	2654	90 4 40	2635	91 42 47	2617
	Spica W.	48 39 36	2341	50 24 36	2321	52 10 5	2302	53 56 2	2282
	α Aquilæ E.	54 44 24	3536	53 24 40	3578	52 5 42	3596	50 47 36	3582
	JUPITER E.	56 43 17	2980	54 56 19	2943	53 8 55	2943	51 21 5	2920
	Fomalhaut E.	82 25 39	2473	80 43 48	2458	79 1 35	2443	77 19 0	2428
	α Pegasi E.	100 4 26	2716	98 28 8	2695	96 51 21	2674	95 14 6	2654
28	VENUS W.	99 59 38	2528	101 40 12	2512	103 21 9	2495	105 2 29	2480
	Spica W.	62 52 46	2192	64 41 25	2176	66 30 28	2160	68 19 56	2145
	JUPITER E.	42 15 51	2131	40 25 39	2117	38 35 5	2103	36 44 10	2089
	Fomalhaut E.	68 41 14	2365	66 56 49	2356	65 12 12	2348	63 27 22	2341
	α Pegasi E.	87 1 39	2572	85 22 4	2559	83 42 12	2546	82 2 2	2536
29	Spica W.	77 32 43	2078	79 24 16	2067	81 16 6	2056	83 8 13	2046
	Antares W.	31 45 45	2128	33 36 2	2109	35 26 47	2093	37 17 57	2077
	JUPITER E.	27 25 2	2041	25 32 29	2032	23 39 44	2024	21 46 46	2019
	Fomalhaut E.	54 41 21	2326	52 56 2	2331	51 10 49	2337	49 25 44	2345
	α Pegasi E.	73 38 15	2504	71 57 8	2503	70 15 59	2504	68 34 51	2507
30	Spica W.	92 32 17	2008	94 25 39	2003	96 19 9	1998	98 12 46	1994
	Antares W.	46 38 59	2020	48 32 0	2014	50 25 13	2007	52 18 37	2001
	Fomalhaut E.	40 44 51	2441	39 2 13	2475	37 20 25	2517	35 39 36	2568
	α Pegasi E.	60 11 13	2556	58 31 18	2575	56 51 49	2597	55 12 50	2623
	α Arietis E.	101 28 33	2109	99 37 48	2103	97 46 53	2097	95 55 49	2092
31	Spica W.	107 41 48	1990	109 35 38	1992	111 29 25	1994	113 23 8	1996
	Antares W.	61 47 18	1987	63 41 12	1987	65 35 6	1986	67 28 59	1990
	α Pegasi E.	47 8 43	2628	45 34 51	2627	44 2 15	2635	42 31 6	2633
	α Arietis E.	86 39 12	2085	84 47 50	2066	82 56 30	2069	81 5 14	2064

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Subtracted from Apparent Time.				
Frid.	1	8 ^h 46 ^m 16.74 ^s	9.702	N. 17° 58' 57.5"	-37.90	15' 48.08"	66.64	6 ^m 4.78 ^s	0.154		
Sat.	2	8 50 9.28	9.677	17 43 39.1	38.63	15 48.21	66.55	6 0.78	0.179		
SUN.	3	8 54 1.22	9.652	17 28 3.4	39.34	15 48.34	66.46	5 56.18	0.304		
Mon.	4	8 57 52.57	9.628	17 12 10.6	-40.05	15 48.47	66.37	5 50.98	0.328		
Tues.	5	9 1 43.33	9.604	16 56 1.1	40.74	15 48.60	66.29	5 45.21	0.352		
Wed.	6	9 5 33.51	9.580	16 39 35.2	41.42	15 48.74	66.20	5 38.85	0.376		
Thur.	7	9 9 23.12	9.555	16 22 53.0	-42.09	15 48.98	66.12	5 31.91	0.300		
Frid.	8	9 13 12.15	9.531	16 5 55.0	42.75	15 49.03	66.03	5 24.40	0.324		
Sat.	9	9 17 0.62	9.508	15 48 41.3	43.39	15 49.18	65.95	5 16.34	0.347		
SUN.	10	9 20 48.53	9.485	15 31 12.4	-44.02	15 49.34	65.86	5 7.72	0.370		
Mon.	11	9 24 35.88	9.462	15 13 28.4	44.64	15 49.50	65.77	4 58.54	0.393		
Tues.	12	9 28 22.68	9.439	14 55 29.8	45.25	15 49.66	65.69	4 48.81	0.416		
Wed.	13	9 32 8.94	9.416	14 37 16.8	-45.84	15 49.83	65.61	4 38.54	0.439		
Thur.	14	9 35 54.66	9.394	14 18 49.7	46.42	15 50.00	65.53	4 27.74	0.461		
Frid.	15	9 39 39.84	9.372	14 0 8.9	46.98	15 50.17	65.45	4 16.40	0.483		
Sat.	16	9 43 24.49	9.350	13 41 14.7	-47.54	15 50.35	65.38	4 4.53	0.505		
SUN.	17	9 47 8.62	9.328	13 22 7.4	48.07	15 50.54	65.30	3 52.13	0.527		
Mon.	18	9 50 52.23	9.307	13 2 47.4	48.59	15 50.73	65.23	3 39.22	0.548		
Tues.	19	9 54 35.34	9.286	12 43 14.9	-49.10	15 50.93	65.16	3 25.81	0.569		
Wed.	20	9 58 17.94	9.265	12 23 30.4	49.59	15 51.13	65.09	3 11.90	0.590		
Thur.	21	10 2 0.05	9.245	12 3 34.1	50.07	15 51.33	65.02	2 57.50	0.610		
Frid.	22	10 5 41.68	9.225	11 43 26.5	-50.54	15 51.54	64.96	2 42.62	0.629		
Sat.	23	10 9 22.85	9.206	11 23 7.9	51.00	15 51.75	64.89	2 27.27	0.648		
SUN.	24	10 13 3.57	9.187	11 2 38.5	51.44	15 51.96	64.83	2 11.48	0.667		
Mon.	25	10 16 43.85	9.168	10 41 58.6	-51.87	15 52.17	64.77	1 55.25	0.685		
Tues.	26	10 20 23.71	9.152	10 21 8.7	52.28	15 52.39	64.71	1 38.60	0.702		
Wed.	27	10 24 3.17	9.136	10 0 9.0	52.68	15 52.61	64.65	1 21.55	0.718		
Thur.	28	10 27 42.24	9.120	9 38 59.9	-53.07	15 52.83	64.60	1 4.11	0.734		
Frid.	29	10 31 20.94	9.105	9 17 41.5	53.45	15 53.05	64.55	0 46.31	0.749		
Sat.	30	10 34 59.30	9.091	8 56 14.4	53.81	15 53.28	64.50	0 28.17	0.763		
SUN.	31	10 38 37.33	9.078	8 34 38.7	54.16	15 53.50	64.45	0 9.70	0.776		
Mon.	32	10 42 15.05	9.066	N. 8 12 54.8	-54.50	15 53.73	64.40	0 9.08	0.788		

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sideral time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
						Added to Mean Time.		
Frid.	1	^h 8 ^m 46 ^s 15.76	9.702	N. 17° 59' 1.4"	-37.90	^m 6 ^s 4.80	0.154	^h 8 ^m 40 ^s 10.96
Sat.	2	8 50 8.31	9.677	17 43 43.0	38.63	6 0.79	0.179	8 44 7.52
SUN.	3	8 54 0.27	9.652	17 28 7.3	39.34	5 56.19	0.204	8 48 4.07
Mon.	4	8 57 51.63	9.628	17 12 14.5	-40.05	5 51.00	0.228	8 52 0.63
Tues.	5	9 1 42.41	9.604	16 56 5.0	40.74	5 45.23	0.252	8 55 57.18
Wed.	6	9 5 32.61	9.580	16 39 39.1	41.42	5 38.87	0.276	8 59 53.74
Thur.	7	9 9 22.24	9.556	16 22 56.9	-42.09	5 31.93	0.300	9 3 50.80
Frid.	8	9 13 11.29	9.532	16 5 58.8	42.75	5 24.43	0.324	9 7 46.86
Sat.	9	9 16 59.78	9.509	15 48 45.1	43.39	5 16.37	0.347	9 11 43.41
SUN.	10	9 20 47.71	9.486	15 31 16.1	-44.02	5 7.75	0.370	9 15 39.97
Mon.	11	9 24 35.09	9.463	15 13 32.1	44.64	4 58.57	0.393	9 19 36.52
Tues.	12	9 28 21.92	9.440	14 55 33.4	45.25	4 48.84	0.416	9 23 33.08
Wed.	13	9 32 8.21	9.417	14 37 20.3	-45.84	4 38.57	0.439	9 27 29.63
Thur.	14	9 35 53.96	9.395	14 18 53.1	46.42	4 27.77	0.461	9 31 26.19
Frid.	15	9 39 39.17	9.373	14 0 12.2	46.98	4 16.43	0.483	9 35 22.74
Sat.	16	9 43 23.85	9.351	13 41 17.9	-47.54	4 4.56	0.505	9 39 19.30
SUN.	17	9 47 8.01	9.329	13 22 10.5	48.08	3 52.16	0.527	9 43 15.85
Mon.	18	9 50 51.66	9.308	13 2 50.3	48.60	3 39.25	0.548	9 47 12.41
Tues.	19	9 54 34.80	9.287	12 43 17.7	-49.11	3 25.84	0.569	9 51 8.96
Wed.	20	9 58 17.44	9.266	12 23 33.0	49.60	3 11.93	0.590	9 55 5.51
Thur.	21	10 1 59.59	9.246	12 3 36.6	50.08	2 57.53	0.610	9 59 2.06
Frid.	22	10 5 41.26	9.227	11 43 28.8	-50.55	2 42.65	0.629	10 2 58.62
Sat.	23	10 9 22.47	9.208	11 23 10.0	51.01	2 27.30	0.648	10 6 55.17
SUN.	24	10 13 3.23	9.189	11 2 40.4	51.45	2 11.50	0.667	10 10 51.73
Mon.	25	10 16 43.56	9.171	10 42 0.3	-51.88	1 55.27	0.685	10 14 48.28
Tues.	26	10 20 23.46	9.154	10 21 10.2	52.29	1 38.62	0.702	10 18 44.84
Wed.	27	10 24 2.96	9.138	10 0 10.3	52.69	1 21.57	0.718	10 22 41.39
Thur.	28	10 27 42.07	9.122	9 39 0.9	-53.08	1 4.12	0.734	10 26 37.95
Frid.	29	10 31 20.82	9.107	9 17 42.3	53.46	0 46.32	0.749	10 30 34.50
Sat.	30	10 34 59.23	9.093	8 56 14.9	53.82	0 28.17	0.763	10 34 31.05
SUN.	31	10 38 37.80	9.080	8 34 38.9	54.17	0 9.70	0.776	10 38 27.60
Mon.	32	10 42 15.07	9.068	N. 8 12 54.7	-54.51	0 9.08	0.788	10 42 24.16

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 hour,
+ 9^h 8565
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		λ	λ'						
1	213	129° 8' 3.2	7' 49.7	143.52	— 0.48	0.0063304	—24.1	15 17 18.34	
2	214	130 5 28.2	5 14.5	143.56	0.54	0.0062720	24.6	15 13 22.43	
3	215	131 2 54.1	2 40.3	143.60	0.57	0.0062125	25.1	15 9 26.52	
4	216	132 0 21.1	0 7.1	143.65	— 0.58	0.0061517	—25.6	15 5 30.61	
5	217	132 57 49.4	57 35.2	143.70	0.56	0.0060895	26.2	15 1 34.70	
6	218	133 55 19.0	55 4.7	143.75	0.50	0.0060259	26.8	14 57 38.79	
7	219	134 52 49.9	52 35.5	143.81	— 0.42	0.0059608	—27.4	14 53 42.89	
8	220	135 50 22.2	50 7.7	143.87	0.31	0.0058941	28.1	14 49 46.98	
9	221	136 47 55.8	47 41.1	143.92	0.19	0.0058257	28.9	14 45 51.07	
10	222	137 45 30.8	45 15.9	143.98	— 0.06	0.0057554	—29.7	14 41 55.16	
11	223	138 43 7.3	42 52.3	144.04	+ 0.07	0.0056831	30.5	14 37 59.24	
12	224	139 40 45.2	40 30.1	144.10	0.19	0.0056087	31.4	14 34 3.33	
13	225	140 38 24.5	38 9.3	144.16	+ 0.31	0.0055323	—32.3	14 30 7.42	
14	226	141 36 5.2	35 49.8	144.23	0.41	0.0054538	33.2	14 26 11.51	
15	227	142 33 47.2	33 31.7	144.29	0.48	0.0053731	34.1	14 22 15.60	
16	228	143 31 30.6	31 15.0	144.34	+ 0.52	0.0052902	—35.0	14 18 19.69	
17	229	144 29 15.3	28 59.6	144.39	0.54	0.0052051	35.9	14 14 23.78	
18	230	145 27 1.2	26 45.4	144.44	0.52	0.0051180	36.7	14 10 27.88	
19	231	146 24 48.2	24 32.3	144.49	+ 0.47	0.0050289	—37.5	14 6 31.98	
20	232	147 22 36.5	22 20.4	144.54	0.40	0.0049379	38.3	14 2 36.07	
21	233	148 20 26.0	20 9.8	144.59	0.30	0.0048451	39.0	13 58 40.16	
22	234	149 18 16.7	18 0.4	144.64	+ 0.19	0.0047507	—39.6	13 54 44.25	
23	235	150 16 8.6	15 52.2	144.69	+ 0.06	0.0046549	40.2	13 50 48.34	
24	236	151 14 1.7	13 45.1	144.74	— 0.08	0.0045578	40.7	13 46 52.43	
25	237	152 11 56.0	11 39.3	144.79	— 0.21	0.0044594	—41.2	13 42 56.52	
26	238	153 9 51.6	9 34.8	144.85	0.33	0.0043600	41.6	13 39 0.62	
27	239	154 7 48.6	7 31.7	144.90	0.44	0.0042598	41.9	13 35 4.72	
28	240	155 5 47.0	5 30.0	144.96	— 0.54	0.0041588	—42.2	13 31 8.81	
29	241	156 3 46.9	3 29.7	145.02	0.61	0.0040571	42.5	13 27 12.90	
30	242	157 1 48.4	1 31.1	145.09	0.65	0.0039548	42.8	13 23 16.99	
31	243	157 59 51.5	59 34.1	145.16	0.66	0.0038518	43.0	13 19 21.08	
32	244	158 57 56.3	57 38.8	145.24	— 0.64	0.0037483	—43.2	13 15 25.17	
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .									Diff. for 1 Hour, — 9 ^h .8396. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
1	16' 45.2	16' 43.0	61' 22.4	-0.45	61' 14.6	-0.85	^h 13 ^m 18.3	^m 2.45	^d 15.5	
2	16 39.7	16 35.1	61 2.2	1.22	60 45.5	1.55	14 15.1	2.28	16.5	
3	16 29.6	16 23.3	60 25.2	1.82	60 1.9	2.04	15 7.8	2.13	17.5	
4	16 16.3	16 8.9	59 36.4	-2.20	59 9.2	-2.30	15 57.5	2.03	18.5	
5	16 1.3	15 53.6	58 41.2	2.35	58 12.9	2.35	16 45.5	1.99	19.5	
6	15 46.0	15 38.5	57 44.9	2.30	57 17.7	2.22	17 32.8	1.97	20.5	
7	15 31.4	15 24.7	56 51.6	-2.12	56 26.9	-1.99	18 20.3	1.99	21.5	
8	15 18.5	15 12.7	56 4.0	1.84	55 42.9	1.68	19 8.4	2.02	22.5	
9	15 7.5	15 2.8	55 23.7	1.52	55 6.5	1.35	19 57.4	2.06	23.5	
10	14 58.7	14 55.1	54 51.3	-1.18	54 38.2	-1.02	20 47.6	2.10	24.5	
11	14 52.0	14 49.5	54 26.9	0.86	54 17.6	0.71	21 38.2	2.09	25.5	
12	14 47.4	14 45.8	54 10.0	0.56	54 4.2	0.43	22 28.0	2.04	26.5	
13	14 44.7	14 44.0	53 59.9	-0.30	53 57.2	-0.17	23 16.0	1.96	27.5	
14	14 43.6	14 43.7	53 56.0	-0.05	53 56.2	+0.06	6		28.5	
15	14 44.1	14 44.9	53 57.8	0.19	54 0.6	0.30	0 2.5	1.89	29.5	
16	14 46.0	14 47.5	54 4.8	+0.41	54 10.3	+0.52	0 47.0	1.82	0.8	
17	14 49.4	14 51.6	54 17.2	0.64	54 25.4	0.75	1 29.9	1.76	1.8	
18	14 54.2	14 57.2	54 35.0	0.86	54 46.0	0.99	2 11.7	1.74	2.8	
19	15 0.6	15 4.5	54 58.5	+1.11	55 12.6	+1.25	2 53.3	1.75	3.8	
20	15 8.8	15 13.4	55 28.3	1.38	55 45.5	1.51	3 35.6	1.79	4.8	
21	15 18.6	15 24.1	56 4.4	1.64	56 24.7	1.76	4 19.5	1.89	5.8	
22	15 30.2	15 36.4	56 46.5	+1.88	57 9.7	+1.98	5 6.2	2.02	6.8	
23	15 43.0	15 49.8	57 34.0	2.06	57 59.1	2.12	5 56.7	2.20	7.8	
24	15 56.8	16 3.8	58 24.8	2.15	58 50.5	2.13	6 51.7	2.38	8.8	
25	16 10.7	16 17.4	59 15.9	+2.08	59 40.4	+1.98	7 50.9	2.53	9.8	
26	16 23.6	16 29.3	60 3.3	1.82	60 24.0	1.61	8 53.4	2.62	10.8	
27	16 34.1	16 38.1	60 41.9	1.35	60 56.8	1.04	9 56.7	2.61	11.8	
28	16 40.9	16 42.5	61 6.7	+0.69	61 12.7	+0.31	10 58.6	2.52	12.8	
29	16 42.9	16 42.0	61 14.1	-0.09	61 10.6	-0.50	11 57.5	2.38	13.8	
30	16 39.7	16 36.2	61 2.3	0.89	60 49.4	1.25	12 52.8	2.24	14.8	
31	16 31.6	16 25.9	60 32.4	1.58	60 11.7	1.86	13 45.1	2.13	15.8	
32	16 19.5	16 12.4	59 48.0	-2.08	59 22.0	-2.24	14 35.3	2.07	16.8	

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	21 26 36.87	2.6031	S. 19° 29' 22.5	10.060	0	23 24 8.82	2.2664	S. 9° 25' 35.2	14.316
1	21 29 12.87	2.5968	19 19 14.8	10.196	1	23 26 26.55	2.2697	9 11 15.0	14.266
2	21 31 48.50	2.5907	19 8 59.0	10.330	2	23 28 43.95	2.2679	8 56 52.5	14.303
3	21 34 23.76	2.5845	18 58 35.2	10.469	3	23 31 1.02	2.2617	8 42 27.8	14.439
4	21 36 58.64	2.5783	18 48 3.5	10.593	4	23 33 17.76	2.2702	8 28 1.0	14.463
5	21 39 33.15	2.5720	18 37 24.0	10.732	5	23 35 34.17	2.2709	8 13 32.2	14.497
6	21 42 7.28	2.5656	18 26 36.9	10.848	6	23 37 50.26	2.2656	7 59 1.4	14.528
7	21 44 41.02	2.5592	18 15 42.3	10.973	7	23 40 6.04	2.2603	7 44 28.9	14.556
8	21 47 14.38	2.5527	18 4 40.3	11.095	8	23 42 21.50	2.2551	7 29 54.7	14.583
9	21 49 47.35	2.5463	17 53 30.9	11.216	9	23 44 36.65	2.2499	7 15 18.9	14.609
10	21 52 19.94	2.5398	17 42 14.4	11.334	10	23 46 51.49	2.2449	7 0 41.6	14.632
11	21 54 52.13	2.5332	17 30 50.8	11.451	11	23 49 6.04	2.2400	6 46 3.0	14.654
12	21 57 23.93	2.5267	17 19 20.3	11.565	12	23 51 20.29	2.2351	6 31 23.1	14.675
13	21 59 55.33	2.5201	17 7 43.0	11.677	13	23 53 34.25	2.2302	6 16 42.0	14.693
14	22 2 26.34	2.5136	16 55 59.0	11.787	14	23 55 47.92	2.2254	6 1 59.9	14.710
15	22 4 56.96	2.5070	16 44 8.5	11.896	15	23 58 1.30	2.2207	5 47 16.8	14.726
16	22 7 27.18	2.5004	16 32 11.5	12.002	16	0 0 14.40	2.2161	5 32 32.8	14.739
17	22 9 57.00	2.4938	16 20 8.3	12.105	17	0 2 27.23	2.2116	5 17 48.1	14.751
18	22 12 26.43	2.4872	16 7 58.9	12.207	18	0 4 39.79	2.2071	5 3 2.7	14.762
19	22 14 55.46	2.4805	15 55 43.4	12.307	19	0 6 52.08	2.2026	4 48 16.7	14.771
20	22 17 24.09	2.4738	15 43 22.0	12.405	20	0 9 4.10	2.1989	4 33 30.2	14.778
21	22 19 52.32	2.4672	15 30 54.8	12.501	21	0 11 15.86	2.1939	4 18 43.4	14.783
22	22 22 20.15	2.4606	15 18 21.9	12.593	22	0 13 27.37	2.1897	4 3 56.3	14.787
23	22 24 47.59	2.4540	S. 15 5 43.4	12.687	23	0 15 38.63	2.1857	S. 3 49 9.0	14.790
SATURDAY 2.					MONDAY 4.				
0	22 27 14.63	2.4473	S. 14 52 59.5	12.776	0	0 17 49.65	2.1817	S. 3 34 21.5	14.799
1	22 29 41.27	2.4407	14 40 10.3	12.863	1	0 20 0.43	2.1777	3 19 34.0	14.791
2	22 32 7.52	2.4342	14 27 15.9	12.948	2	0 22 10.97	2.1737	3 4 46.6	14.766
3	22 34 33.38	2.4277	14 14 16.5	13.032	3	0 24 21.27	2.1698	2 49 59.4	14.735
4	22 36 58.85	2.4212	14 1 12.1	13.113	4	0 26 31.35	2.1661	2 35 12.4	14.781
5	22 39 23.93	2.4147	13 48 2.9	13.192	5	0 28 41.20	2.1624	2 20 25.7	14.774
6	22 41 48.61	2.4082	13 34 49.0	13.270	6	0 30 50.83	2.1587	2 5 39.5	14.760
7	22 44 12.91	2.4018	13 21 30.5	13.345	7	0 33 0.25	2.1552	1 50 53.8	14.757
8	22 46 36.82	2.3953	13 8 7.6	13.417	8	0 35 9.46	2.1518	1 36 8.6	14.747
9	22 49 0.34	2.3889	12 54 40.4	13.488	9	0 37 18.47	2.1485	1 21 24.1	14.735
10	22 51 23.48	2.3826	12 41 9.0	13.557	10	0 39 27.28	2.1452	1 6 40.4	14.722
11	22 53 46.25	2.3763	12 27 33.5	13.625	11	0 41 35.89	2.1419	0 51 57.5	14.707
12	22 56 8.64	2.3700	12 13 54.0	13.690	12	0 43 44.30	2.1387	0 37 15.6	14.690
13	22 58 30.65	2.3638	12 0 10.7	13.752	13	0 45 52.53	2.1357	0 22 34.7	14.673
14	23 0 52.29	2.3576	11 46 23.7	13.813	14	0 48 0.58	2.1327	S. 0 7 54.8	14.655
15	23 3 13.56	2.3514	11 32 33.1	13.872	15	0 50 8.45	2.1297	N. 0 6 43.9	14.635
16	23 5 34.46	2.3453	11 18 39.0	13.929	16	0 52 16.14	2.1268	0 21 21.4	14.614
17	23 7 55.00	2.3393	11 4 41.6	13.984	17	0 54 23.67	2.1241	0 35 57.6	14.592
18	23 10 15.18	2.3333	10 50 40.9	14.037	18	0 56 31.03	2.1214	0 50 32.4	14.568
19	23 12 35.00	2.3273	10 36 37.1	14.088	19	0 58 38.23	2.1187	1 5 5.7	14.543
20	23 14 54.46	2.3214	10 22 30.3	14.137	20	1 0 45.27	2.1161	1 19 37.5	14.517
21	23 17 13.57	2.3156	10 8 20.6	14.185	21	1 2 52.16	2.1136	1 34 7.7	14.489
22	23 19 32.33	2.3098	9 54 8.1	14.231	22	1 4 58.91	2.1112	1 48 36.2	14.461
23	23 21 50.75	2.3041	9 39 52.9	14.274	23	1 7 5.51	2.1088	2 3 3.0	14.431
24	23 24 8.82	2.2984	S. 9 25 35.2	14.316	24	1 9 11.97	2.1066	N. 2 17 27.9	14.399

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	1 ^h 9 ^m 11.97	2.1066	N. 2° 17' 27.9"	14.309	0	2 ^h 48 ^m 58.87	2.0743	N. 12° 53' 19.3"	11.742
1	1 11 18.30	2.1044	2 31 50.9	14.367	1	2 51 3.35	2.0750	13 5 1.5	11.085
2	1 13 24.50	2.1022	2 46 12.0	14.335	2	2 53 7.87	2.0757	13 16 39.1	11.587
3	1 15 30.57	2.1009	3 0 31.1	14.301	3	2 55 12.44	2.0765	13 28 12.0	11.510
4	1 17 36.52	2.0989	3 14 48.1	14.265	4	2 57 17.05	2.0773	13 39 40.3	11.439
5	1 19 42.36	2.0963	3 29 2.9	14.228	5	2 59 21.71	2.0782	13 51 3.9	11.363
6	1 21 48.08	2.0945	3 43 15.4	14.190	6	3 1 26.43	2.0791	14 2 22.7	11.273
7	1 23 53.70	2.0927	3 57 25.7	14.153	7	3 3 31.20	2.0800	14 13 36.7	11.192
8	1 25 59.21	2.0910	4 11 33.6	14.113	8	3 5 36.03	2.0809	14 24 45.8	11.111
9	1 28 4.62	2.0894	4 25 39.1	14.071	9	3 7 40.91	2.0818	14 35 50.0	11.029
10	1 30 9.94	2.0878	4 39 42.1	14.029	10	3 9 45.85	2.0829	14 46 49.3	10.947
11	1 32 15.16	2.0863	4 53 42.5	13.985	11	3 11 50.86	2.0841	14 57 43.7	10.865
12	1 34 20.29	2.0848	5 7 40.3	13.941	12	3 13 55.94	2.0852	15 8 33.1	10.781
13	1 36 25.34	2.0835	5 21 35.4	13.896	13	3 16 1.08	2.0863	15 19 17.4	10.696
14	1 38 30.31	2.0823	5 35 27.8	13.850	14	3 18 6.29	2.0874	15 29 56.6	10.610
15	1 40 35.21	2.0810	5 49 17.4	13.802	15	3 20 11.57	2.0886	15 40 30.6	10.524
16	1 42 40.03	2.0798	6 3 4.1	13.754	16	3 22 16.92	2.0898	15 50 59.5	10.437
17	1 44 44.79	2.0787	6 16 47.9	13.706	17	3 24 22.35	2.0911	16 1 23.1	10.350
18	1 46 49.48	2.0777	6 30 28.8	13.657	18	3 26 27.86	2.0924	16 11 41.5	10.262
19	1 48 54.11	2.0768	6 44 6.7	13.605	19	3 28 33.44	2.0937	16 21 54.6	10.174
20	1 50 58.69	2.0759	6 57 41.4	13.552	20	3 30 39.10	2.0951	16 32 2.4	10.085
21	1 53 3.22	2.0751	7 11 12.9	13.499	21	3 32 44.85	2.0965	16 42 4.8	9.995
22	1 55 7.70	2.0743	7 24 41.2	13.445	22	3 34 50.68	2.0978	16 52 1.8	9.904
23	1 57 12.14	2.0736	N. 7 38 6.3	13.391	23	3 36 56.59	2.0992	N. 17 1 53.3	9.813
WEDNESDAY 6.					FRIDAY 8.				
0	1 59 16.53	2.0729	N. 7 51 28.1	13.335	0	3 39 2.59	2.1007	N. 17 11 39.4	9.729
1	2 1 20.89	2.0724	8 4 40.5	13.278	1	3 41 8.67	2.1021	17 21 19.9	9.639
2	2 3 25.22	2.0719	8 18 1.5	13.221	2	3 43 14.84	2.1036	17 30 54.9	9.536
3	2 5 29.52	2.0714	8 31 13.0	13.162	3	3 45 21.10	2.1051	17 40 24.3	9.443
4	2 7 33.79	2.0709	8 44 20.9	13.103	4	3 47 27.45	2.1066	17 49 48.1	9.349
5	2 9 38.03	2.0705	8 57 25.2	13.042	5	3 49 33.89	2.1081	17 59 6.2	9.254
6	2 11 42.25	2.0703	9 10 25.9	12.981	6	3 51 40.42	2.1097	18 8 18.6	9.159
7	2 13 46.46	2.0701	9 23 22.9	12.919	7	3 53 47.05	2.1112	18 17 25.3	9.063
8	2 15 50.66	2.0699	9 36 16.2	12.857	8	3 55 53.77	2.1127	18 26 26.2	8.967
9	2 17 54.85	2.0698	9 49 5.7	12.793	9	3 58 0.58	2.1143	18 35 21.3	8.870
10	2 19 59.04	2.0698	10 1 51.4	12.729	10	4 0 7.49	2.1159	18 44 10.6	8.778
11	2 22 3.23	2.0697	10 14 33.1	12.663	11	4 2 14.49	2.1175	18 52 54.0	8.674
12	2 24 7.41	2.0697	10 27 10.9	12.597	12	4 4 21.59	2.1191	19 1 31.5	8.575
13	2 26 11.60	2.0699	10 39 44.7	12.530	13	4 6 28.79	2.1207	19 10 3.0	8.476
14	2 28 15.80	2.0701	10 52 14.5	12.462	14	4 8 36.08	2.1223	19 18 28.6	8.377
15	2 30 20.01	2.0703	11 4 40.2	12.393	15	4 10 43.47	2.1240	19 26 48.2	8.277
16	2 32 24.21	2.0705	11 17 1.7	12.323	16	4 12 50.96	2.1256	19 35 1.8	8.176
17	2 34 28.47	2.0708	11 29 19.0	12.253	17	4 14 58.55	2.1272	19 43 9.3	8.074
18	2 36 32.73	2.0712	11 41 32.1	12.182	18	4 17 6.23	2.1288	19 51 10.7	7.972
19	2 38 37.01	2.0716	11 53 40.9	12.111	19	4 19 14.01	2.1305	19 59 6.0	7.870
20	2 40 41.32	2.0721	12 5 45.4	12.038	20	4 21 21.89	2.1322	20 6 55.1	7.767
21	2 42 45.66	2.0726	12 17 45.5	11.965	21	4 23 29.87	2.1338	20 14 38.0	7.663
22	2 44 50.03	2.0731	12 29 41.2	11.892	22	4 25 37.95	2.1354	20 22 14.7	7.559
23	2 46 54.43	2.0737	12 41 32.5	11.817	23	4 27 46.12	2.1370	20 29 45.1	7.455
24	2 48 58.87	2.0743	N. 12 53 19.3	11.742	24	4 29 54.39	2.1387	N. 20 37 9.3	7.351

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	h m s	°	N. 20° 37' 9.3"	7.351	0	h m s	°	N. 24° 21' 43.6"	1.683
1	4 29 54.39	2.1387	20 44 27.2	7.945	1	6 14 3.86	2.1891	24 23 33.6	1.774
2	4 32 2.76	2.1403	20 51 38.7	7.139	2	6 16 15.21	2.1892	24 25 16.5	1.656
3	4 34 11.22	2.1418	20 58 43.9	7.033	3	6 18 26.56	2.1893	24 26 52.3	1.537
4	4 36 19.78	2.1434	21 5 42.7	6.926	4	6 20 37.92	2.1893	24 28 20.9	1.418
5	4 38 28.43	2.1450	21 12 35.1	6.819	5	6 22 49.28	2.1893	24 29 42.4	1.299
6	4 40 37.18	2.1467	21 19 21.0	6.719	6	6 25 0.63	2.1892	24 30 56.8	1.180
7	4 42 46.03	2.1483	21 26 0.5	6.604	7	6 27 11.98	2.1891	24 32 4.0	1.060
8	4 44 54.97	2.1498	21 32 33.5	6.495	8	6 29 23.32	2.1888	24 33 4.0	0.941
9	4 47 4.00	2.1513	21 38 59.9	6.386	9	6 31 34.64	2.1885	24 33 56.9	0.822
10	4 49 13.13	2.1529	21 45 19.8	6.277	10	6 33 45.94	2.1882	24 34 42.6	0.703
11	4 51 22.35	2.1543	21 51 33.1	6.167	11	6 35 57.22	2.1878	24 35 21.2	0.584
12	4 53 31.65	2.1557	21 57 39.9	6.057	12	6 38 8.48	2.1874	24 35 52.7	0.465
13	4 55 41.04	2.1572	22 3 40.0	5.947	13	6 40 19.71	2.1869	24 36 17.0	0.346
14	4 57 50.52	2.1587	22 9 33.5	5.836	14	6 42 30.91	2.1864	24 36 34.2	0.227
15	5 0 0.08	2.1601	22 15 20.3	5.724	15	6 44 42.08	2.1859	24 36 44.3	+ 0.108
16	5 2 9.73	2.1615	22 21 0.4	5.613	16	6 46 53.22	2.1853	24 36 47.2	- 0.011
17	5 4 19.46	2.1629	22 26 33.8	5.501	17	6 49 4.32	2.1847	24 36 43.0	0.199
18	5 6 29.28	2.1643	22 32 0.5	5.388	18	6 51 15.38	2.1839	24 36 31.7	0.086
19	5 8 39.18	2.1656	22 37 20.4	5.276	19	6 53 26.39	2.1831	24 36 13.3	0.366
20	5 10 49.16	2.1669	22 42 33.6	5.163	20	6 55 37.35	2.1822	24 35 47.8	0.483
21	5 12 59.21	2.1682	22 47 40.0	5.050	21	6 57 48.26	2.1814	24 35 15.3	0.601
22	5 15 9.34	2.1694	22 52 39.6	4.936	22	6 59 59.12	2.1805	24 34 35.7	0.719
23	5 17 19.54	2.1707	N. 22° 57' 32.3"	4.821	23	7 2 9.92	2.1794	N. 24° 33' 49.0"	0.837
24	5 19 29.82	2.1719				7 4 20.65	2.1783		
SUNDAY 10.					TUESDAY 12.				
0	5 21 40.17	2.1730	N. 23° 2' 18.1"	4.706	0	7 6 31.32	2.1773	N. 24° 32' 55.2"	0.955
1	5 23 50.58	2.1741	23 6 57.0	4.592	1	7 8 41.93	2.1769	24 31 54.4	1.079
2	5 26 1.06	2.1752	23 11 29.1	4.477	2	7 10 52.46	2.1749	24 30 46.6	1.188
3	5 28 11.61	2.1763	23 15 54.3	4.362	3	7 13 2.92	2.1736	24 29 31.8	1.305
4	5 30 22.22	2.1773	23 20 12.6	4.247	4	7 15 13.30	2.1733	24 28 10.0	1.431
5	5 32 32.89	2.1783	23 24 23.9	4.131	5	7 17 23.60	2.1710	24 26 41.2	1.537
6	5 34 43.62	2.1792	23 28 28.3	4.015	6	7 19 33.82	2.1696	24 25 5.5	1.653
7	5 36 54.40	2.1809	23 32 25.7	3.899	7	7 21 43.95	2.1681	24 23 22.8	1.770
8	5 39 5.24	2.1811	23 36 16.1	3.783	8	7 23 53.99	2.1667	24 21 33.1	1.886
9	5 41 16.13	2.1819	23 39 59.6	3.666	9	7 26 3.95	2.1652	24 19 36.5	2.001
10	5 43 27.07	2.1827	23 43 36.0	3.548	10	7 28 13.81	2.1635	24 17 33.0	2.116
11	5 45 38.05	2.1834	23 47 5.4	3.431	11	7 30 23.57	2.1618	24 15 22.6	2.230
12	5 47 49.08	2.1841	23 50 27.7	3.313	12	7 32 33.23	2.1601	24 13 5.4	2.344
13	5 50 0.15	2.1848	23 53 43.0	3.196	13	7 34 42.79	2.1584	24 10 41.3	2.458
14	5 52 11.26	2.1854	23 56 51.2	3.078	14	7 36 52.24	2.1566	24 8 10.4	2.572
15	5 54 22.40	2.1860	23 59 52.4	2.961	15	7 39 1.58	2.1547	24 5 32.6	2.686
16	5 56 33.58	2.1866	24 2 46.5	2.843	16	7 41 10.81	2.1528	24 2 48.1	2.799
17	5 58 44.79	2.1870	24 5 33.5	2.725	17	7 43 19.92	2.1508	23 59 56.8	2.911
18	6 0 56.02	2.1874	24 8 13.5	2.607	18	7 45 28.91	2.1488	23 56 58.8	3.023
19	6 3 7.28	2.1878	24 10 46.3	2.488	19	7 47 37.78	2.1468	23 53 54.0	3.135
20	6 5 18.56	2.1882	24 13 12.0	2.369	20	7 49 46.53	2.1448	23 50 42.6	3.246
21	6 7 29.87	2.1886	24 15 30.6	2.251	21	7 51 55.16	2.1427	23 47 24.5	3.357
22	6 9 41.19	2.1888	24 17 42.1	2.132	22	7 54 3.66	2.1406	23 43 59.7	3.468
23	6 11 52.52	2.1889	24 19 46.4	2.012	23	7 56 12.03	2.1384	23 40 28.3	3.578
24	6 14 3.86	2.1891	N. 24° 21' 43.6"	1.893	24	7 58 20.26	2.1361	N. 23° 36' 50.3"	3.689

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	"	N. 23 36 50.3	3.888	0	h m s	"	N. 18 43 21.1	8.310
1	8 0 28.36	2.1338	23 33 5.7	3.797	1	9 39 45.22	1.9968	18 35 0.1	8.390
2	8 2 36.32	2.1315	23 29 14.6	3.906	2	9 41 44.94	1.9938	18 26 34.3	8.470
3	8 4 44.14	2.1292	23 25 17.0	4.014	3	9 43 44.48	1.9908	18 18 3.7	8.549
4	8 6 51.82	2.1268	23 21 12.9	4.122	4	9 45 43.84	1.9878	18 9 28.4	8.628
5	8 8 59.36	2.1244	23 17 2.3	4.230	5	9 47 43.02	1.9847	18 0 48.4	8.708
6	8 11 6.75	2.1219	23 12 45.3	4.337	6	9 49 42.01	1.9817	17 52 3.7	8.783
7	8 13 13.99	2.1194	23 8 21.9	4.443	7	9 51 40.83	1.9788	17 43 14.4	8.859
8	8 15 21.08	2.1169	23 3 52.1	4.549	8	9 53 39.47	1.9758	17 34 20.6	8.934
9	8 17 28.02	2.1144	22 59 16.0	4.655	9	9 55 37.93	1.9729	17 25 22.3	9.009
10	8 19 34.81	2.1118	22 54 33.5	4.760	10	9 57 36.22	1.9700	17 16 19.5	9.084
11	8 21 41.44	2.1093	22 49 44.8	4.864	11	9 59 34.33	1.9670	17 7 12.2	9.158
12	8 23 47.91	2.1068	22 44 49.8	4.968	12	10 1 32.26	1.9641	16 58 0.5	9.231
13	8 25 54.22	2.1038	22 39 48.6	5.072	13	10 3 30.02	1.9612	16 48 44.5	9.303
14	8 28 0.37	2.1011	22 34 41.2	5.175	14	10 5 27.61	1.9584	16 39 24.2	9.374
15	8 30 6.36	2.0984	22 29 27.6	5.277	15	10 7 25.03	1.9556	16 29 59.6	9.445
16	8 32 12.18	2.0957	22 24 7.9	5.379	16	10 9 22.28	1.9527	16 20 30.8	9.514
17	8 34 17.84	2.0929	22 18 42.1	5.480	17	10 11 19.36	1.9499	16 10 57.9	9.589
18	8 36 23.33	2.0901	22 13 10.3	5.581	18	10 13 16.27	1.9479	16 1 20.9	9.651
19	8 38 28.65	2.0873	22 7 32.4	5.681	19	10 15 13.02	1.9444	15 51 39.8	9.719
20	8 40 33.80	2.0844	22 1 48.6	5.780	20	10 17 9.60	1.9417	15 41 54.6	9.787
21	8 42 38.78	2.0815	21 55 58.8	5.879	21	10 19 6.02	1.9390	15 32 5.4	9.853
22	8 44 43.58	2.0786	21 50 3.1	5.977	22	10 21 2.28	1.9363	15 22 12.2	9.918
23	8 46 48.21	2.0757	N. 21 44 1.5	6.075	23	10 22 58.38	1.9336	N. 15 12 15.2	9.983
THURSDAY 14.					SATURDAY 16.				
0	8 48 52.67	2.0738	N. 21 37 54.1	6.173	0	10 24 54.31	1.9309	N. 15 2 14.3	10.047
1	8 50 56.95	2.0698	21 31 40.9	6.268	1	10 26 50.09	1.9284	14 52 9.6	10.110
2	8 53 1.05	2.0669	21 25 21.9	6.365	2	10 28 45.72	1.9258	14 42 1.1	10.173
3	8 55 4.98	2.0640	21 18 57.1	6.461	3	10 30 41.19	1.9233	14 31 48.8	10.236
4	8 57 8.73	2.0610	21 12 26.6	6.555	4	10 32 36.51	1.9207	14 21 32.8	10.297
5	8 59 12.30	2.0579	21 5 50.5	6.648	5	10 34 31.68	1.9183	14 11 13.2	10.357
6	9 1 15.68	2.0549	20 59 8.8	6.742	6	10 36 26.71	1.9159	14 0 50.0	10.417
7	9 3 18.88	2.0519	20 52 21.5	6.835	7	10 38 21.59	1.9134	13 50 23.2	10.476
8	9 5 21.91	2.0489	20 45 28.6	6.927	8	10 40 16.32	1.9110	13 39 52.9	10.534
9	9 7 24.75	2.0458	20 38 30.2	7.018	9	10 42 10.91	1.9087	13 29 19.2	10.591
10	9 9 27.11	2.0428	20 31 26.4	7.108	10	10 44 5.36	1.9064	13 18 42.0	10.648
11	9 11 29.89	2.0397	20 24 17.2	7.199	11	10 45 59.68	1.9042	13 8 1.4	10.705
12	9 13 32.18	2.0367	20 17 2.5	7.289	12	10 47 53.86	1.9019	12 57 17.4	10.761
13	9 15 34.29	2.0336	20 9 42.5	7.378	13	10 49 47.91	1.8997	12 46 30.1	10.815
14	9 17 36.21	2.0305	20 2 17.2	7.466	14	10 51 41.83	1.8975	12 35 39.6	10.868
15	9 19 37.95	2.0274	19 54 46.6	7.553	15	10 53 35.61	1.8953	12 24 45.9	10.921
16	9 21 39.50	2.0243	19 47 10.8	7.640	16	10 55 29.27	1.8932	12 13 49.0	10.974
17	9 23 40.87	2.0213	19 39 29.8	7.726	17	10 57 22.80	1.8910	12 2 49.0	11.026
18	9 25 42.06	2.0182	19 31 43.7	7.811	18	10 59 16.21	1.8889	11 51 45.9	11.077
19	9 27 43.06	2.0152	19 23 52.5	7.896	19	11 1 9.50	1.8873	11 40 39.7	11.127
20	9 29 43.88	2.0122	19 15 56.2	7.980	20	11 3 2.68	1.8853	11 29 30.6	11.177
21	9 31 44.52	2.0091	19 7 54.1	8.064	21	11 4 55.74	1.8834	11 18 18.5	11.228
22	9 33 44.97	2.0060	18 59 48.6	8.147	22	11 6 48.68	1.8815	11 7 3.5	11.274
23	9 35 45.24	2.0029	18 51 37.3	8.229	23	11 8 41.52	1.8797	10 55 45.6	11.322
24	9 37 45.32	1.9998	N. 18 43 21.1	8.310	24	11 10 34.25	1.8779	N. 10 44 24.8	11.370

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	11 10 34.25	1.8779	N. 10° 44' 24.8"	11.370	0	12 39 36.30	1.8596	N. 0° 58' 34.8"	12.764
1	11 12 26.87	1.8769	10 33 1.2	11.415	1	12 41 27.48	1.8535	0 45 48.6	12.775
2	11 14 19.39	1.8746	10 21 35.0	11.459	2	12 43 18.72	1.8545	0 33 1.8	12.786
3	11 16 11.82	1.8730	10 10 6.1	11.503	3	12 45 10.02	1.8555	0 20 14.3	12.796
4	11 18 4.15	1.8713	9 58 34.6	11.548	4	12 47 1.38	1.8566	N. 0 7 26.3	12.804
5	11 19 56.38	1.8697	9 47 0.4	11.593	5	12 48 52.81	1.8577	S. 0 5 22.2	12.812
6	11 21 48.52	1.8680	9 35 23.6	11.634	6	12 50 44.31	1.8589	0 18 11.2	12.820
7	11 23 40.57	1.8668	9 23 44.3	11.675	7	12 52 35.88	1.8602	0 31 0.6	12.827
8	11 25 32.54	1.8654	9 12 2.6	11.716	8	12 54 27.53	1.8615	0 43 50.4	12.833
9	11 27 24.42	1.8640	9 0 18.4	11.757	9	12 56 19.26	1.8628	0 56 40.5	12.838
10	11 29 16.22	1.8627	8 48 31.8	11.796	10	12 58 11.07	1.8642	1 9 30.9	12.843
11	11 31 7.95	1.8615	8 36 42.9	11.835	11	13 0 2.97	1.8658	1 22 21.6	12.847
12	11 32 59.60	1.8603	8 24 51.6	11.873	12	13 1 54.97	1.8674	1 35 12.5	12.849
13	11 34 51.18	1.8591	8 12 58.1	11.910	13	13 3 47.06	1.8691	1 48 3.5	12.851
14	11 36 42.69	1.8580	8 1 2.4	11.947	14	13 5 39.26	1.8708	2 0 54.6	12.852
15	11 38 34.14	1.8570	7 49 4.5	11.983	15	13 7 31.56	1.8726	2 13 45.8	12.853
16	11 40 25.53	1.8559	7 37 4.4	12.018	16	13 9 23.97	1.8744	2 26 37.0	12.854
17	11 42 16.85	1.8548	7 25 2.3	12.053	17	13 11 16.49	1.8763	2 39 28.1	12.851
18	11 44 8.11	1.8539	7 12 58.1	12.087	18	13 13 9.13	1.8783	2 52 19.1	12.849
19	11 45 59.32	1.8531	7 0 51.9	12.119	19	13 15 1.89	1.8804	3 5 10.0	12.847
20	11 47 50.49	1.8524	6 48 43.8	12.151	20	13 16 54.78	1.8825	3 18 0.7	12.843
21	11 49 41.61	1.8516	6 36 33.8	12.183	21	13 18 47.79	1.8847	3 30 51.2	12.839
22	11 51 32.63	1.8508	6 24 21.9	12.214	22	13 20 40.94	1.8870	3 43 41.4	12.834
23	11 53 23.71	1.8502	N. 6 12 8.1	12.245	23	13 22 34.23	1.8893	S. 3 56 31.3	12.828
MONDAY 18.					WEDNESDAY 20.				
0	11 55 14.71	1.8496	N. 5 59 52.5	12.274	0	13 24 27.66	1.8917	S. 4 9 20.8	12.822
1	11 57 5.67	1.8491	5 47 35.2	12.303	1	13 26 21.23	1.8941	4 22 9.9	12.814
2	11 58 56.60	1.8487	5 35 16.2	12.331	2	13 28 14.95	1.8967	4 34 58.5	12.806
3	12 0 47.51	1.8483	5 22 55.5	12.358	3	13 30 8.83	1.8993	4 47 46.6	12.797
4	12 2 38.39	1.8478	5 10 33.2	12.384	4	13 32 2.87	1.9020	5 0 34.1	12.786
5	12 4 29.25	1.8475	4 58 9.4	12.410	5	13 33 57.07	1.9047	5 13 20.9	12.774
6	12 6 20.09	1.8473	4 45 44.0	12.436	6	13 35 51.43	1.9074	5 26 7.0	12.763
7	12 8 10.92	1.8471	4 33 17.1	12.460	7	13 37 45.96	1.9103	5 38 52.4	12.751
8	12 10 1.74	1.8469	4 20 48.8	12.484	8	13 39 40.67	1.9133	5 51 37.1	12.737
9	12 11 52.55	1.8468	4 8 19.1	12.507	9	13 41 35.56	1.9163	6 4 20.9	12.722
10	12 13 43.36	1.8468	3 55 48.0	12.529	10	13 43 30.63	1.9194	6 17 3.8	12.707
11	12 15 34.17	1.8468	3 43 15.6	12.551	11	13 45 25.89	1.9226	6 29 45.8	12.691
12	12 17 24.98	1.8469	3 30 41.9	12.573	12	13 47 21.34	1.9258	6 42 26.8	12.674
13	12 19 15.80	1.8471	3 18 7.0	12.595	13	13 49 16.98	1.9291	6 55 6.7	12.657
14	12 21 6.63	1.8473	3 5 30.9	12.611	14	13 51 12.83	1.9325	7 7 45.6	12.638
15	12 22 57.47	1.8475	2 52 53.7	12.629	15	13 53 8.88	1.9359	7 20 23.3	12.618
16	12 24 48.33	1.8479	2 40 15.4	12.647	16	13 55 5.14	1.9394	7 32 59.8	12.597
17	12 26 39.22	1.8483	2 27 36.1	12.664	17	13 57 1.61	1.9429	7 45 35.0	12.576
18	12 28 30.13	1.8487	2 14 55.7	12.681	18	13 58 58.29	1.9466	7 58 8.9	12.553
19	12 30 21.07	1.8493	2 2 14.3	12.697	19	14 0 55.20	1.9503	8 10 41.4	12.529
20	12 32 12.04	1.8497	1 49 32.0	12.719	20	14 2 52.33	1.9541	8 23 12.4	12.504
21	12 34 3.04	1.8504	1 36 48.9	12.735	21	14 4 49.69	1.9579	8 35 41.9	12.479
22	12 35 54.08	1.8511	1 24 5.0	12.758	22	14 6 47.28	1.9618	8 48 9.0	12.453
23	12 37 45.17	1.8518	1 11 20.3	12.781	23	14 8 45.11	1.9658	9 0 36.3	12.427
24	12 39 36.30	1.8526	N. 0 58 34.8	12.804	24	14 10 43.18	1.9698	S. 9 13 1.1	12.399

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	14 10 43.18	1.9898	S. 9 13' 1.1"	19.399	0	15 51 11.98	2.2393	S. 18 15' 6.3"	9.730
1	14 12 41.49	1.9740	9 25 24.2	19.370	1	15 53 26.54	2.2462	18 24 47.5	9.643
2	14 14 40.06	1.9782	9 37 45.5	19.339	2	15 55 41.52	2.2532	18 34 23.5	9.555
3	14 16 38.88	1.9825	9 50 4.9	19.307	3	15 57 56.92	2.2601	18 43 54.1	9.465
4	14 18 37.96	1.9868	10 2 22.4	19.275	4	16 0 12.73	2.2670	18 53 19.3	9.374
5	14 20 37.30	1.9912	10 14 37.9	19.243	5	16 2 28.96	2.2739	19 2 39.0	9.282
6	14 22 36.91	1.9957	10 26 51.4	19.208	6	16 4 45.60	2.2809	19 11 53.2	9.189
7	14 24 36.79	2.0002	10 39 2.8	19.173	7	16 7 2.67	2.2880	19 21 1.7	9.093
8	14 26 36.94	2.0048	10 51 12.1	19.137	8	16 9 20.16	2.2950	19 30 4.4	8.996
9	14 28 37.37	2.0096	11 3 19.2	19.099	9	16 11 38.07	2.3021	19 39 1.2	8.897
10	14 30 38.09	2.0143	11 15 24.0	19.061	10	16 13 56.41	2.3092	19 47 52.1	8.798
11	14 32 39.09	2.0191	11 27 26.5	19.022	11	16 16 15.17	2.3163	19 56 37.0	8.697
12	14 34 40.38	2.0240	11 39 26.6	11.981	12	16 18 34.36	2.3234	20 5 15.7	8.594
13	14 36 41.97	2.0290	11 51 24.2	11.939	13	16 20 53.98	2.3305	20 13 48.2	8.490
14	14 38 43.86	2.0339	12 3 19.3	11.897	14	16 23 14.02	2.3376	20 22 14.5	8.385
15	14 40 46.04	2.0389	12 15 11.8	11.853	15	16 25 34.49	2.3447	20 30 34.4	8.278
16	14 42 48.53	2.0441	12 27 1.7	11.808	16	16 27 55.39	2.3519	20 38 47.8	8.169
17	14 44 51.34	2.0494	12 38 48.8	11.762	17	16 30 16.72	2.3591	20 46 54.7	8.059
18	14 46 54.46	2.0547	12 50 33.1	11.715	18	16 32 38.48	2.3662	20 54 54.9	7.947
19	14 48 57.90	2.0600	13 2 14.6	11.667	19	16 35 0.67	2.3733	21 2 48.4	7.834
20	14 51 1.66	2.0654	13 13 53.1	11.617	20	16 37 23.28	2.3804	21 10 35.0	7.719
21	14 53 5.75	2.0709	13 25 28.6	11.567	21	16 39 46.32	2.3876	21 18 14.7	7.603
22	14 55 10.17	2.0764	13 37 1.1	11.515	22	16 42 9.79	2.3947	21 25 47.4	7.486
23	14 57 14.92	2.0819	S. 13 48 30.4	11.462	23	16 44 33.68	2.4017	S. 21 33 13.0	7.367
FRIDAY 22.					SUNDAY 24.				
0	14 59 20.00	2.0876	S. 13 59 56.5	11.407	0	16 46 58.00	2.4088	S. 21 40 31.4	7.246
1	15 1 25.43	2.0933	14 11 19.3	11.359	1	16 49 22.74	2.4158	21 47 42.5	7.134
2	15 3 31.20	2.0991	14 22 38.8	11.306	2	16 51 47.90	2.4229	21 54 46.3	7.001
3	15 5 37.32	2.1049	14 33 54.8	11.258	3	16 54 13.49	2.4300	22 1 42.6	6.875
4	15 7 43.79	2.1108	14 45 7.3	11.179	4	16 56 39.50	2.4369	22 8 31.3	6.748
5	15 9 50.62	2.1167	14 56 16.3	11.130	5	16 59 5.92	2.4438	22 15 12.4	6.621
6	15 11 57.80	2.1227	15 7 21.7	11.058	6	17 1 32.76	2.4507	22 21 45.8	6.492
7	15 14 5.35	2.1288	15 18 23.3	10.985	7	17 4 0.01	2.4576	22 28 11.4	6.361
8	15 16 13.26	2.1349	15 29 21.1	10.933	8	17 6 27.67	2.4645	22 34 20.1	6.228
9	15 18 21.54	2.1411	15 40 15.1	10.866	9	17 8 55.75	2.4713	22 40 38.8	6.094
10	15 20 30.19	2.1474	15 51 5.1	10.799	10	17 11 24.23	2.4780	22 46 40.4	5.958
11	15 22 39.22	2.1537	16 1 51.0	10.739	11	17 13 53.11	2.4847	22 52 33.8	5.829
12	15 24 48.63	2.1600	16 12 32.9	10.663	12	17 16 22.39	2.4913	22 58 19.0	5.694
13	15 26 58.42	2.1663	16 23 10.6	10.592	13	17 18 52.07	2.4979	23 3 55.9	5.544
14	15 29 8.59	2.1727	16 33 44.0	10.521	14	17 21 22.14	2.5045	23 9 24.3	5.409
15	15 31 19.14	2.1791	16 44 13.1	10.447	15	17 23 52.61	2.5110	23 14 44.2	5.260
16	15 33 30.08	2.1856	16 54 37.7	10.373	16	17 26 23.46	2.5173	23 19 55.5	5.116
17	15 35 41.42	2.1922	17 4 57.9	10.298	17	17 28 54.69	2.5237	23 24 58.1	4.971
18	15 37 53.15	2.1988	17 15 13.5	10.222	18	17 31 26.30	2.5300	23 29 52.0	4.825
19	15 40 5.28	2.2055	17 25 24.5	10.143	19	17 33 58.29	2.5362	23 34 37.1	4.677
20	15 42 17.81	2.2122	17 35 30.7	10.069	20	17 36 30.64	2.5423	23 39 13.2	4.527
21	15 44 30.74	2.2189	17 45 32.0	9.991	21	17 39 3.36	2.5483	23 43 40.3	4.377
22	15 46 44.08	2.2257	17 55 28.1	9.909	22	17 41 36.44	2.5543	23 47 58.4	4.225
23	15 48 57.83	2.2325	18 5 19.9	9.816	23	17 44 9.88	2.5603	23 52 7.3	4.071
24	15 51 11.98	2.2393	S. 18 15 6.3	9.730	24	17 46 43.67	2.5660	S. 23 56 6.9	3.916

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	^h 17 ^m 46 ^s 43.67	2.5690	S. 23° 56' 6.9"	3.916	0	^h 19 ^m 54 ^s 17.46	2.6946	S. 23° 48' 14.3"	4.447
1	17 49 17.80	2.5717	23 59 57.2	3.761	1	19 56 59.11	2.6937	23 43 42.1	4.696
2	17 51 52.27	2.5773	24 3 38.2	3.604	2	19 59 40.70	2.6925	23 38 59.2	4.904
3	17 54 27.08	2.5898	24 7 9.7	3.446	3	20 2 22.21	2.6919	23 34 5.6	4.963
4	17 57 2.21	2.5898	24 10 31.7	3.287	4	20 5 3.64	2.6908	23 29 1.3	5.161
5	17 59 37.66	2.5935	24 13 44.1	3.136	5	20 7 44.98	2.6892	23 23 46.3	5.338
6	18 2 13.43	2.5987	24 16 46.8	2.983	6	20 10 26.23	2.6886	23 18 20.7	5.515
7	18 4 49.51	2.6038	24 19 39.7	2.800	7	20 13 7.37	2.6877	23 12 44.5	5.690
8	18 7 25.89	2.6087	24 22 22.8	2.637	8	20 15 48.39	2.6867	23 6 57.9	5.864
9	18 10 2.56	2.6136	24 24 56.1	2.473	9	20 18 29.29	2.6856	23 1 0.8	6.038
10	18 12 39.52	2.6184	24 27 19.5	2.307	10	20 21 10.06	2.6783	22 54 53.3	6.212
11	18 15 16.77	2.6232	24 29 32.9	2.139	11	20 23 50.69	2.6760	22 48 35.4	6.384
12	18 17 54.30	2.6277	24 31 36.2	1.971	12	20 26 31.18	2.6735	22 42 7.2	6.555
13	18 20 32.09	2.6320	24 33 29.4	1.802	13	20 29 11.51	2.6708	22 35 26.8	6.726
14	18 23 10.14	2.6362	24 35 12.4	1.632	14	20 31 51.67	2.6690	22 28 40.1	6.897
15	18 25 48.44	2.6403	24 36 45.2	1.461	15	20 34 31.67	2.6652	22 21 41.2	7.068
16	18 28 26.98	2.6443	24 38 7.7	1.289	16	20 37 11.49	2.6621	22 14 32.2	7.233
17	18 31 5.76	2.6482	24 39 19.9	1.117	17	20 39 51.12	2.6590	22 7 13.3	7.398
18	18 33 44.77	2.6520	24 40 21.7	0.943	18	20 42 30.56	2.6557	21 59 44.5	7.563
19	18 36 24.00	2.6556	24 41 13.1	0.769	19	20 45 9.80	2.6523	21 52 5.8	7.729
20	18 39 3.44	2.6590	24 41 54.0	0.594	20	20 47 48.84	2.6489	21 44 17.2	7.891
21	18 41 43.08	2.6623	24 42 24.4	0.419	21	20 50 27.67	2.6453	21 36 18.9	8.059
22	18 44 22.92	2.6656	24 42 44.3	0.242	22	20 53 6.28	2.6416	21 28 10.9	8.213
23	18 47 2.95	2.6688	S. 24° 42' 53.5"	- 0.065	23	20 55 44.66	2.6378	S. 21° 19' 53.3"	8.373
TUESDAY 26.					THURSDAY 28.				
0	18 49 43.15	2.6714	S. 24° 42' 52.1"	+ 0.112	0	20 58 22.81	2.6339	S. 21° 11' 26.3"	8.529
1	18 52 23.52	2.6742	24 42 40.1	0.939	1	21 1 0.73	2.6309	21 2 49.9	8.685
2	18 55 4.05	2.6768	24 42 17.4	0.768	2	21 3 38.40	2.6258	20 54 4.1	8.841
3	18 57 44.73	2.6792	24 41 42.9	0.648	3	21 6 15.82	2.6216	20 45 9.0	8.995
4	19 0 25.55	2.6815	24 40 59.6	0.526	4	21 8 52.99	2.6173	20 36 4.7	9.147
5	19 3 6.51	2.6837	24 40 4.5	1.008	5	21 11 29.90	2.6129	20 26 51.4	9.297
6	19 5 47.59	2.6856	24 38 58.6	1.188	6	21 14 6.54	2.6084	20 17 29.1	9.446
7	19 8 28.78	2.6874	24 37 41.9	1.368	7	21 16 42.91	2.6039	20 7 57.9	9.593
8	19 11 10.08	2.6891	24 36 14.4	1.549	8	21 19 19.01	2.5994	19 58 17.9	9.739
9	19 13 51.47	2.6906	24 34 36.0	1.730	9	21 21 54.84	2.5948	19 48 29.2	9.883
10	19 16 32.95	2.6920	24 32 46.8	1.911	10	21 24 30.39	2.5901	19 38 31.9	10.026
11	19 19 14.51	2.6932	24 30 46.7	2.092	11	21 27 5.65	2.5852	19 28 26.1	10.167
12	19 21 56.13	2.6942	24 28 35.7	2.274	12	21 29 40.62	2.5803	19 18 11.9	10.306
13	19 24 37.81	2.6951	24 26 13.8	2.456	13	21 32 15.29	2.5754	19 7 49.4	10.443
14	19 27 19.54	2.6958	24 23 41.0	2.637	14	21 34 49.67	2.5705	18 57 18.7	10.580
15	19 30 1.31	2.6964	24 20 57.3	2.819	15	21 37 23.75	2.5654	18 46 39.8	10.715
16	19 32 43.11	2.6968	24 18 2.7	3.001	16	21 39 57.52	2.5603	18 35 52.9	10.847
17	19 35 24.93	2.6971	24 14 57.2	3.183	17	21 42 30.98	2.5552	18 24 58.2	10.977
18	19 38 6.76	2.6972	24 11 40.7	3.365	18	21 45 4.14	2.5500	18 13 55.7	11.106
19	19 40 48.59	2.6972	24 8 13.4	3.546	19	21 47 36.98	2.5447	18 2 45.5	11.232
20	19 43 30.42	2.6970	24 4 35.2	3.727	20	21 50 9.51	2.5395	17 51 27.8	11.357
21	19 46 12.23	2.6968	24 0 46.2	3.907	21	21 52 41.72	2.5342	17 40 2.6	11.481
22	19 48 54.01	2.6961	23 56 46.3	4.087	22	21 55 13.61	2.5288	17 28 30.1	11.609
23	19 51 35.76	2.6954	23 52 35.7	4.267	23	21 57 45.18	2.5235	17 16 50.3	11.729
24	19 54 17.46	2.6946	S. 23° 48' 14.3"	4.447	24	22 0 16.43	2.5181	S. 17° 5' 3.4"	11.846

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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FRIDAY 29.

0	22 0 16.43	2.5181	S. 17° 5' 3.4"	11.940
1	22 2 47.35	2.5197	16 53 9.5	11.956
2	22 5 17.95	2.5072	16 41 8.7	12.009
3	22 7 48.22	2.5017	16 29 1.2	12.181
4	22 10 18.16	2.4989	16 16 47.0	12.391
5	22 12 47.77	2.4907	16 4 26.3	12.398
6	22 15 17.05	2.4858	15 51 59.2	12.504
7	22 17 46.00	2.4797	15 39 25.8	12.606
8	22 20 14.62	2.4749	15 26 46.2	12.710
9	22 22 42.91	2.4687	15 14 0.6	12.809
10	22 25 10.87	2.4639	15 1 9.1	12.908
11	22 27 38.49	2.4577	14 48 11.7	13.004
12	22 30 5.79	2.4522	14 35 8.6	13.097
13	22 32 32.76	2.4467	14 22 0.0	13.189
14	22 34 59.39	2.4411	14 8 45.9	13.280
15	22 37 25.69	2.4356	13 55 26.4	13.368
16	22 39 51.66	2.4301	13 42 1.7	13.453
17	22 42 17.30	2.4247	13 28 32.0	13.536
18	22 44 42.62	2.4199	13 14 57.4	13.617
19	22 47 7.61	2.4137	13 1 17.9	13.697
20	22 49 32.27	2.4083	12 47 33.7	13.776
21	22 51 56.61	2.4029	12 33 44.8	13.851
22	22 54 20.62	2.3975	12 19 51.5	13.924
23	22 56 44.31	2.3929	S. 12° 5' 53.9"	13.996

SATURDAY 30.

0	22 59 7.69	2.3870	S. 11° 51' 52.0"	14.066
1	23 1 30.75	2.3817	11 37 46.0	14.133
2	23 3 53.49	2.3764	11 23 36.0	14.198
3	23 6 15.92	2.3719	11 9 22.2	14.260
4	23 8 38.03	2.3680	10 55 4.6	14.323
5	23 10 59.84	2.3609	10 40 43.4	14.382
6	23 13 21.34	2.3558	10 26 18.7	14.440
7	23 15 42.54	2.3507	10 11 50.6	14.496
8	23 18 3.43	2.3457	9 57 19.3	14.548
9	23 20 24.02	2.3407	9 42 44.8	14.600
10	23 22 44.31	2.3358	9 28 7.3	14.649
11	23 25 4.31	2.3309	9 13 26.9	14.697
12	23 27 24.02	2.3261	8 58 43.6	14.743
13	23 29 43.44	2.3213	8 43 57.7	14.788
14	23 32 2.57	2.3165	8 29 9.3	14.837
15	23 34 21.42	2.3118	8 14 18.4	14.887
16	23 36 39.99	2.3072	7 59 25.2	14.936
17	23 38 58.28	2.3026	7 44 29.8	14.940
18	23 41 16.30	2.2981	7 29 32.4	14.973
19	23 43 34.05	2.2936	7 14 33.0	15.006
20	23 45 51.53	2.2891	6 59 31.7	15.037
21	23 48 8.74	2.2847	6 44 28.6	15.065
22	23 50 25.60	2.2803	6 29 23.9	15.091
23	23 52 42.38	2.2761	6 14 17.7	15.115
24	23 54 58.82	2.2719	S. 5° 59' 10.1"	15.137

SUNDAY 31.

0	23 54 58.82	2.2719	S. 5° 59' 10.1"	15.137
1	23 57 15.01	2.2678	5 44 1.2	15.158
2	23 59 30.95	2.2637	5 28 51.1	15.177
3	0 1 46.65	2.2597	5 13 40.0	15.193
4	0 4 2.11	2.2557	4 58 27.9	15.209
5	0 6 17.33	2.2518	4 43 14.9	15.223
6	0 8 32.32	2.2479	4 28 1.1	15.235
7	0 10 47.08	2.2441	4 12 46.7	15.244
8	0 13 1.62	2.2404	3 57 31.8	15.259
9	0 15 15.93	2.2368	3 42 16.4	15.269
10	0 17 30.03	2.2339	3 27 0.7	15.284
11	0 19 43.91	2.2306	3 11 44.7	15.297
12	0 21 57.58	2.2261	2 56 28.6	15.308
13	0 24 11.04	2.2227	2 41 12.5	15.317
14	0 26 24.30	2.2194	2 25 56.5	15.326
15	0 28 37.37	2.2169	2 10 40.6	15.333
16	0 30 50.25	2.2130	1 55 25.0	15.337
17	0 33 2.93	2.2096	1 40 9.8	15.350
18	0 35 15.42	2.2067	1 24 55.0	15.343
19	0 37 27.73	2.2037	1 9 40.8	15.331
20	0 39 39.86	2.2007	0 54 27.3	15.319
21	0 41 51.82	2.1979	0 39 14.5	15.306
22	0 44 3.61	2.1951	0 24 2.6	15.191
23	0 46 15.23	2.1923	S. 0° 8' 51.6"	15.174

MONDAY, SEPTEMBER 1.

0	0 48 26.68	2.1895	N. 0° 6' 18.3"	15.156
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PHASES OF THE MOON.

☾ Last Quarter . . . Aug.	7	2	18.7
● New Moon	15	4	19.6
☾ First Quarter	23	1	19.7
○ Full Moon	29	16	35.0

☾ Apogee Aug.	14	43
☾ Perigee	28	21.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares W.	69° 22' 48"	1993	71° 16' 34"	1997	73° 10' 14"	2001	75° 3' 47"	2006
	α Arietis E.	79 14 5	2098	77 23 3	2103	75 32 9	2111	73 41 27	2120
	Aldebaran E.	109 49 38	1980	107 55 32	1984	106 1 33	1989	104 7 41	1994
2	Antares W.	84 29 2	2044	86 21 27	2054	88 13 36	2065	90 5 29	2076
	α Aquilæ W.	46 27 21	2675	47 44 35	2690	49 3 20	2512	50 23 31	2444
	JUPITER W.	26 29 15	2009	28 22 35	2016	30 15 44	2025	32 8 40	2034
	α Arietis E.	64 31 43	2178	62 42 43	2124	60 54 6	2210	59 5 54	2229
	Aldebaran E.	94 40 56	2033	92 48 14	2043	90 55 47	2054	89 3 37	2065
3	Antares W.	99 20 17	2141	101 10 13	2156	102 59 47	2179	104 48 57	2188
	α Aquilæ W.	57 20 36	2212	58 46 24	2191	60 12 44	2167	61 39 33	2148
	JUPITER W.	41 29 18	2092	43 20 29	2105	45 11 20	2130	47 1 49	2134
	α Arietis E.	50 12 15	2239	48 27 13	2269	46 42 54	2298	44 59 15	2428
	Aldebaran E.	79 47 23	2120	77 57 10	2145	76 7 20	2160	74 17 53	2176
4	α Aquilæ W.	68 58 3	2100	70 26 13	2098	71 54 25	2099	73 22 36	2101
	JUPITER W.	56 8 30	2213	57 56 38	2220	59 44 21	2247	61 31 38	2264
	Aldebaran E.	65 16 36	2259	63 29 36	2277	61 43 2	2295	59 56 55	2313
	Sun E.	129 9 5	2561	127 29 16	2579	125 49 52	2597	124 10 53	2616
5	α Aquilæ W.	80 42 1	2139	82 9 23	2152	83 36 30	2165	85 3 21	2179
	JUPITER W.	70 21 40	2253	72 6 23	2271	73 50 40	2289	75 34 31	2407
	Fomalhaut W.	46 10 30	2733	47 46 26	2733	49 22 22	2735	50 58 15	2738
	α Pegasi W.	34 19 52	2012	35 31 20	2024	36 44 46	2035	37 59 53	2046
	Aldebaran E.	51 13 0	2407	49 29 35	2426	47 46 38	2445	46 4 7	2465
	Sun E.	116 2 19	2711	114 25 54	2730	112 49 53	2749	111 14 19	2768
6	α Aquilæ W.	92 12 54	2267	93 37 44	2287	95 2 11	2309	96 26 12	2331
	JUPITER W.	84 7 23	2425	85 48 43	2413	87 29 38	2431	89 10 9	2448
	Fomalhaut W.	58 56 0	2774	60 31 2	2783	62 5 52	2795	63 40 27	2805
	α Pegasi W.	44 34 6	2440	45 55 37	2407	47 17 44	2380	48 40 23	2358
	Aldebaran E.	37 38 30	2564	35 58 46	2585	34 19 30	2605	32 40 42	2626
	Sun E.	103 22 47	2685	101 49 43	2685	100 17 4	2694	98 44 49	2692
7	α Aquilæ W.	103 19 36	2455	104 40 50	2483	106 1 33	2513	107 21 43	2542
	JUPITER W.	97 26 53	2630	99 5 7	2646	100 42 59	2662	102 20 30	2677
	Fomalhaut W.	71 29 43	2685	73 2 47	2677	74 35 35	2690	76 8 7	2693
	α Pegasi W.	55 38 58	2289	57 3 22	2282	58 27 55	2278	59 52 31	2275
	Sun E.	91 9 23	2612	89 39 25	2622	88 9 49	2646	86 40 33	2663
8	JUPITER W.	110 23 5	2750	111 58 39	2763	113 33 55	2776	115 8 54	2789
	Fomalhaut W.	83 46 42	2967	85 17 36	2979	86 48 14	2992	88 18 37	3005
	α Pegasi W.	66 56 4	2376	68 20 43	2379	69 45 19	2392	71 9 51	2397
	Sun E.	79 19 17	2142	77 51 58	2157	76 24 58	2172	74 58 15	2186
9	Fomalhaut W.	95 46 37	2686	97 15 28	2678	98 44 4	2690	100 12 25	2702
	α Pegasi W.	78 11 5	2314	79 35 0	2321	80 58 47	2327	82 22 27	2325
	α Arietis W.	34 33 29	2282	35 58 1	2265	37 22 53	2251	38 48 2	2240
	Sun E.	67 48 46	2252	66 23 38	2264	64 58 44	2276	63 34 4	2287
10	α Pegasi W.	89 18 37	2372	90 41 25	2381	92 4 3	2390	93 26 31	2398

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares W.	76° 57' 12"	9019	78° 50' 27"	9019	80° 43' 31"	9037	82° 36' 23"	9035
	α Arietis E.	71 50 58	9199	70 0 43	9139	68 10 44	9151	66 21 4	9165
	Aldebaran E.	102 13 58	9001	100 20 25	9008	98 27 3	9016	96 33 53	9094
2	Antares W.	91 57 5	9088	93 48 23	9101	95 39 21	9114	97 29 59	9197
	α Aquilæ W.	51 44 58	9385	53 7 32	9334	54 31 4	9369	55 55 28	9359
	JUPITER W.	34 1 21	9044	35 53 47	9055	37 45 55	9066	39 37 46	9078
	α Arietis E.	57 18 9	9248	55 30 53	9268	53 44 7	9290	51 57 55	9213
	Aldebaran E.	87 11 44	9077	85 20 9	9090	83 28 53	9104	81 37 58	9117
3	Antares W.	106 37 44	9204	108 26 7	9221	110 14 4	9237	112 1 37	9253
	α Aquilæ W.	63 6 45	9132	64 34 16	9190	66 2 1	9110	67 29 59	9104
	JUPITER W.	48 51 56	9149	50 41 40	9164	52 31 1	9180	54 19 58	9196
	α Arietis E.	43 16 20	9462	41 34 13	9500	39 53 2	9541	38 12 46	9583
	Aldebaran E.	72 28 48	9199	70 40 8	9208	68 51 52	9225	67 4 1	9242
4	α Aquilæ W.	74 50 44	9108	76 18 46	9119	77 46 41	9119	79 14 27	9199
	JUPITER W.	63 18 30	9289	65 4 56	9299	66 50 57	9317	68 36 31	9335
	Aldebaran E.	58 11 14	9331	56 26 0	9349	54 41 13	9366	52 56 53	9386
	Sun E.	122 32 19	9635	120 54 11	9654	119 16 28	9673	117 39 11	9692
5	α Aquilæ W.	86 29 55	9186	87 56 10	9211	89 22 6	9229	90 47 41	9247
	JUPITER W.	77 17 56	9494	79 0 56	9442	80 43 30	9460	82 25 39	9478
	Fomalhaut W.	52 34 4	9743	54 9 47	9748	55 45 21	9756	57 20 46	9765
	α Pegasi W.	39 16 29	9637	40 34 21	9576	41 53 21	9594	43 13 19	9480
	Aldebaran E.	44 22 4	9485	42 40 29	9504	40 59 22	9524	39 18 42	9544
	Sun E.	109 39 10	9766	108 4 26	9807	106 30 8	9826	104 56 15	9845
6	α Aquilæ W.	97 49 48	9354	99 12 57	9378	100 35 39	9403	101 57 52	9429
	JUPITER W.	90 50 17	9565	92 30 0	9582	94 9 20	9598	95 48 18	9614
	Fomalhaut W.	65 14 49	9817	66 48 55	9829	68 22 47	9841	69 56 23	9853
	α Pegasi W.	50 3 28	9338	51 26 56	9329	52 50 42	9308	54 14 41	9296
	Aldebaran E.	31 2 22	9646	29 24 32	9669	27 47 10	9692	26 10 20	9716
	Sun E.	97 12 58	9940	95 41 30	9958	94 10 25	9976	92 39 43	9994
7	α Aquilæ W.	108 41 21	9573	110 0 25	9606	111 18 53	9639	112 36 46	9674
	JUPITER W.	103 57 40	9699	105 34 30	9707	107 11 1	9722	108 47 12	9736
	Fomalhaut W.	77 40 23	9916	79 12 22	9928	80 44 5	9941	82 15 31	9954
	α Pegasi W.	61 17 12	9373	62 41 55	9379	64 6 39	9373	65 31 22	9374
	Sun E.	85 11 38	9080	83 43 4	9094	82 14 49	9110	80 46 53	9126
8	JUPITER W.	116 43 35	9601	118 18 1	9613	119 52 10	9626	121 26 4	9638
	Fomalhaut W.	89 48 44	9018	91 18 35	9030	92 48 11	9042	94 17 31	9054
	α Pegasi W.	72 34 17	9291	73 58 39	9297	75 22 54	9302	76 47 3	9306
	Sun E.	73 31 49	9390	72 5 40	9314	70 39 46	9297	69 14 9	9240
9	Fomalhaut W.	101 40 32	9114	103 8 24	9126	104 36 2	9138	106 3 26	9149
	α Pegasi W.	83 45 58	9342	85 9 21	9350	86 32 35	9357	87 55 41	9365
	α Arietis W.	40 13 24	9230	41 38 59	9230	43 4 44	9213	44 30 38	9206
	Sun E.	62 9 37	9298	60 45 23	9309	59 21 21	9319	57 57 32	9329
10	α Pegasi W.	94 48 50	9406	96 10 58	9416	97 32 57	9425	98 54 45	9435

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	α Arietis W. Sun E.	45 56 37 56 33 54	3904 3338	47 22 41 55 10 27	3901 3347	48 48 49 53 47 11	3197 3356	50 15 2 52 24 6	3195 3385
11	α Pegasi W. α Arietis W. Aldebaran W. Sun E.	100 16 22 57 26 30 25 43 50 45 31 4	3445 3193 3078 3406	101 37 48 58 52 49 27 12 27 44 8 54	3454 3191 3077 3413	102 59 4 60 19 9 28 41 6 42 46 52	3465 3193 3076 3430	104 20 7 61 45 28 30 9 44 41 24 59	3475 3191 3076 3437
12	α Arietis W. Aldebaran W. Sun E.	68 56 59 37 32 40 34 37 25	3194 3083 3461	70 23 16 39 1 10 33 16 17	3194 3085 3467	71 49 32 40 29 39 31 55 16	3195 3086 3473	73 15 47 41 58 7 30 34 22	3195 3087 3481
13	α Arietis W. Aldebaran W. Sun E.	80 26 53 49 20 4 23 52 1	3197 3091 3536	81 53 6 50 48 25 22 32 6	3197 3091 3537	83 19 17 52 16 45 21 12 25	3198 3091 3549	84 45 29 53 45 5 19 52 59	3198 3099 3565
17	Sun W. Spica E. Antares E.	20 33 40 38 28 22 84 13 31	3486 3093 3042	21 54 20 37 0 4 82 44 10	3489 3094 3038	23 15 19 35 31 47 81 14 44	3454 3095 3033	24 36 34 34 3 30 79 45 12	3442 3097 3098
18	Sun W. Antares E. α Aquilæ E.	31 26 11 72 16 1 116 3 27	3386 3099 3990	32 48 43 70 45 51 114 50 28	3375 2997 3891	34 11 26 69 15 34 113 36 59	3366 2991 3894	35 34 20 67 45 10 112 23 3	3356 2985 3838
19	Sun W. Antares E. α Aquilæ E. Jupiter E.	42 31 37 60 11 13 106 7 4 116 1 29	3309 2953 3727 2891	43 55 38 58 40 1 104 50 45 114 28 58	3299 2946 3708 2899	45 19 51 57 8 40 103 34 6 112 56 16	3299 2939 3690 2874	46 44 15 55 37 10 102 17 8 111 23 24	3279 2932 3672 2866
20	Sun W. Antares E. α Aquilæ E. Jupiter E.	53 49 20 47 57 18 95 47 50 103 36 15	3225 2894 3596 2920	55 15 0 46 24 51 94 29 11 102 2 14	3214 2886 3583 2810	56 40 53 44 52 13 93 10 18 100 27 59	3202 2878 3570 2900	58 7 0 43 19 25 91 51 11 98 53 32	3190 2870 3558 2789
21	Sun W. Venus W. Antares E. α Aquilæ E. Jupiter E.	65 21 14 22 6 13 35 32 56 85 12 37 90 57 42	3127 3284 2833 3510 2735	66 48 51 23 30 43 33 59 11 83 52 24 89 21 48	3114 3259 2826 3502 2722	68 16 45 24 55 43 32 25 17 82 32 2 87 45 37	3101 3235 2819 3495 2710	69 44 55 26 21 11 30 51 14 81 11 32 86 9 10	3086 3212 2815 3488 2696
22	Sun W. Venus W. Spica W. α Aquilæ E. Jupiter E. Fomalhaut E.	77 10 7 33 35 4 24 38 4 74 27 44 78 2 37 105 50 25	3012 3106 2811 3473 2832 2949	78 40 5 35 3 4 26 12 17 73 6 50 76 24 25 104 17 2	2997 3088 2782 3473 2818 2835	80 10 21 36 31 28 27 47 9 71 45 56 74 45 54 102 43 19	2982 3069 2753 3474 2803 2821	81 40 57 38 0 16 29 22 38 70 25 3 73 7 3 101 9 16	2996 3050 2737 3477 2809 2904
23	Sun W. Venus W. Spica W. α Aquilæ E. Jupiter E.	89 19 1 45 30 7 37 28 11 63 42 5 64 47 52	2884 2955 2814 2518 2515	90 51 40 47 1 16 39 6 47 62 22 1 63 6 59	2867 2936 2593 2534 2499	92 24 41 48 32 48 40 45 52 61 2 14 61 25 45	2849 2917 2573 2551 2485	93 58 4 50 4 45 42 25 24 59 42 46 59 44 10	2832 2896 2553 2571 2489

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	α Arietis	W.	51° 41' 17"	3193	53° 7' 34"	3193	54° 33' 52"	3199	56° 0' 11"	3199
	Sun	E.	51 1 11	3374	49 38 25	3382	48 15 49	3390	46 53 22	3398
11	α Pegasi	W.	105 40 59	3486	107 1 38	3497	108 22 5	3509	109 42 18	3522
	α Arietis	W.	63 11 48	3199	64 38 7	3192	66 4 26	3193	67 30 43	3194
	Aldebaran	W.	31 38 23	3077	33 6 59	3079	34 35 34	3080	36 4 9	3082
	Sun	E.	40 3 13	3434	38 41 35	3441	37 20 5	3448	35 58 41	3455
12	α Arietis	W.	74 42 1	3196	76 8 15	3196	77 34 28	3196	79 0 41	3197
	Aldebaran	W.	43 26 33	3088	44 54 57	3089	46 23 21	3090	47 51 43	3091
	Sun	E.	29 13 37	3486	27 53 0	3485	26 32 30	3504	25 12 10	3514
13	α Arietis	W.	86 11 40	3198	87 37 51	3199	89 4 1	3199	90 30 12	3199
	Aldebaran	W.	55 13 25	3092	56 41 44	3092	58 10 4	3092	59 38 24	3092
	Sun	E.	18 33 50	3584	17 15 1	3606	15 56 36	3630	14 38 41	3655
17	Sun	W.	25 58 3	3430	27 19 46	3418	28 41 43	3408	30 3 51	3397
	Spica	E.	32 35 17	3100	31 7 7	3103	29 39 1	3108	28 11 1	3114
	Antares	E.	78 15 34	3093	76 45 50	3018	75 16 0	3013	73 46 3	3006
18	Sun	W.	36 57 25	3347	38 20 42	3337	39 44 9	3337	41 7 48	3318
	Antares	E.	66 14 38	2979	64 43 59	2973	63 13 12	2966	61 42 16	2960
	α Aquilæ	E.	111 8 40	3613	109 53 51	3790	108 38 38	3768	107 23 2	3746
19	Sun	W.	48 8 51	3369	49 33 39	3358	50 58 40	3347	52 23 53	3326
	Antares	E.	54 5 31	2994	52 33 42	2917	51 1 44	2910	49 29 36	2902
	α Aquilæ	E.	100 59 50	3655	99 42 15	3639	98 24 23	3634	97 6 14	3610
	Jupiter	E.	109 50 21	2857	108 17 7	2948	106 43 42	2939	105 10 5	2929
20	Sun	W.	59 33 21	3178	60 59 57	3166	62 26 47	3153	63 53 53	3140
	Antares	E.	41 46 27	2962	40 13 19	2954	38 40 1	2946	37 6 33	2939
	α Aquilæ	E.	90 31 51	3547	89 12 19	3537	87 52 36	3526	86 32 41	3518
	Jupiter	E.	97 18 50	2779	95 43 55	2769	94 8 46	2757	92 33 22	2745
21	Sun	W.	71 13 22	3073	72 42 6	3058	74 11 8	3049	75 40 29	3038
	Venus	W.	27 47 6	3189	29 13 28	3168	30 40 15	3147	32 7 28	3128
	Antares	E.	29 17 5	2912	27 42 53	2910	26 8 38	2909	24 34 20	2906
	α Aquilæ	E.	79 50 56	3484	78 30 14	3480	77 9 28	3476	75 48 37	3474
	Jupiter	E.	84 32 25	2685	82 55 25	2672	81 18 7	2658	79 40 31	2645
22	Sun	W.	83 11 53	2950	84 43 9	2934	86 14 45	2918	87 46 42	2901
	Venus	W.	39 29 28	3031	40 59 2	3012	42 29 0	2993	43 59 22	2974
	Spica	W.	30 58 40	2702	32 35 17	2679	34 12 25	2656	35 50 4	2635
	α Aquilæ	E.	69 4 14	3481	67 43 29	3468	66 22 52	3466	65 2 23	3506
	Jupiter	E.	71 27 53	2575	69 48 24	2559	68 8 33	2545	66 28 23	2530
	Fomalhaut	E.	99 34 53	2787	98 0 8	2770	96 25 1	2754	94 49 33	2738
23	Sun	W.	95 31 49	2915	97 5 57	2798	98 40 26	2781	100 15 19	2764
	Venus	W.	51 37 5	2989	53 9 49	2961	54 42 58	2942	56 16 31	2923
	Spica	W.	44 5 24	2534	45 45 50	2515	47 26 44	2496	49 8 4	2477
	α Aquilæ	E.	58 23 40	3596	57 5 1	3594	55 46 53	3566	54 29 19	3553
	Jupiter	E.	58 2 13	2453	56 19 53	2437	54 37 11	2421	52 54 6	2405

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III ^h .	P. L. of Diff.	VI ^h .	P. L. of Diff.	IX ^h .	P. L. of Diff.
23	Fomalhaut E.	93 13 43	2722	91 37 32	2706	90 1 0	2689	88 24 6	2674
24	SUN W.	101 50 34	2747	103 26 12	2730	105 2 13	2713	106 38 37	2696
	VENUS W.	57 50 28	2805	59 24 49	2786	60 59 35	2767	62 34 45	2749
	Spica W.	50 49 50	2458	52 32 3	2439	54 14 41	2421	55 57 45	2403
	JUPITER E.	51 10 39	2390	49 26 50	2374	47 42 38	2358	45 58 3	2343
	α Aquilæ E.	53 12 25	2735	51 56 15	2765	50 40 57	2839	49 26 35	2809
	Fomalhaut E.	80 14 27	2599	78 35 31	2585	76 56 15	2573	75 16 43	2559
	α Pegasi E.	98 8 35	2830	96 34 46	2811	95 0 33	2792	93 25 55	2775
25	SUN W.	114 46 23	2809	116 25 5	2583	118 4 9	2577	119 43 35	2561
	VENUS W.	70 36 42	2658	72 14 18	2641	73 52 17	2624	75 30 40	2607
	Spica W.	64 39 29	2317	66 25 4	2300	68 11 4	2283	69 57 9	2267
	JUPITER E.	37 9 32	2386	35 22 42	2359	33 35 32	2337	31 48 0	2324
	Fomalhaut E.	66 54 26	2500	65 13 13	2481	63 31 45	2462	61 50 6	2474
	α Pegasi E.	85 27 12	2606	83 50 27	2584	82 13 25	2571	80 36 6	2550
26	SUN W.	128 6 5	2488	129 47 35	2475	131 29 24	2463	133 11 31	2450
	VENUS W.	83 48 19	2525	85 28 57	2509	87 9 55	2496	88 51 14	2481
	Spica W.	78 55 20	2191	80 44 1	2177	82 33 3	2164	84 22 26	2151
	Antares W.	33 6 50	2931	34 54 31	2913	36 42 39	2194	38 31 16	2178
	Fomalhaut E.	53 19 42	2455	51 37 26	2456	49 55 11	2460	48 13 1	2467
	α Pegasi E.	72 26 18	2621	70 47 53	2616	69 9 23	2617	67 30 51	2616
27	VENUS W.	97 22 32	2419	99 5 39	2408	100 49 1	2399	102 32 37	2389
	Spica W.	93 34 4	2092	95 25 15	2089	97 16 41	2073	99 8 22	2065
	Antares W.	47 40 27	2103	49 31 22	2091	51 22 34	2080	53 14 4	2069
	Fomalhaut E.	39 45 59	2553	38 5 59	2583	36 26 41	2594	34 48 18	2571
	α Pegasi E.	59 19 3	2649	57 41 15	2663	56 3 46	2681	54 26 41	2703
	α Arietis E.	100 29 13	2190	98 40 31	2179	96 51 32	2169	95 2 18	2159
28	Spica W.	108 29 41	2033	110 22 24	2028	112 15 14	2026	114 8 9	2023
	Antares W.	62 35 14	2099	64 28 3	2094	66 21 0	2018	68 14 6	2014
	α Arietis E.	85 52 56	2125	84 2 35	2121	82 12 8	2118	80 21 36	2116
	Aldebaran E.	116 38 19	2018	114 45 13	2013	112 51 59	2006	110 58 37	2005
29	Antares W.	77 40 44	2007	79 34 8	2007	81 27 31	2009	83 20 52	2011
	α Aquilæ W.	42 3 33	4125	43 13 11	3974	44 25 16	3842	45 39 35	3795
	JUPITER W.	22 44 30	1986	24 38 26	1984	26 32 26	1984	28 26 26	1985
	α Arietis E.	71 8 43	2122	69 18 17	2126	67 27 58	2139	65 37 48	2139
	Aldebaran E.	101 30 47	1998	99 37 9	1998	97 43 32	2000	95 49 58	2003
30	Antares W.	92 46 11	2036	94 38 49	2043	96 31 16	2051	98 23 31	2060
	α Aquilæ W.	52 17 56	3318	53 41 47	3292	55 6 43	3214	56 32 36	3172
	JUPITER W.	37 55 45	2001	39 49 17	2008	41 42 39	2015	43 35 50	2023
	α Arietis E.	56 30 17	2194	54 41 42	2210	52 53 30	2226	51 5 45	2247
	Aldebaran E.	86 23 34	2028	84 30 43	2035	82 38 4	2042	80 45 36	2052
31	α Aquilæ W.	63 52 34	3035	65 22 3	3021	66 51 50	3009	68 21 52	2999
	JUPITER W.	52 58 17	2074	54 49 56	2086	56 41 17	2098	58 32 19	2112
	α Arietis E.	42 15 6	2378	40 31 0	2414	38 47 45	2452	37 5 24	2486
	Aldebaran E.	71 27 5	2105	69 36 14	2118	67 45 45	2132	65 55 35	2147

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Fomalhaut E.	86 46 51	2050	85 9 16	2043	83 31 20	2028	81 53 3	2014
24	SUN W.	108 15 25	2078	109 52 35	2060	111 30 8	2043	113 8 4	2026
	VENUS W.	64 10 20	2731	65 46 19	2712	67 22 43	2694	68 59 30	2676
	Spica W.	57 41 15	2385	59 25 11	2368	61 9 32	2351	62 54 18	2334
	JUPITER E.	44 13 6	2387	42 27 46	2311	40 42 3	2286	38 55 58	2269
	α Aquilæ E.	48 13 17	2973	47 1 11	4054	45 50 25	4147	44 41 8	4054
	Fomalhaut E.	73 36 48	2545	71 56 37	2533	70 16 9	2521	68 35 25	2510
	α Pegasi E.	91 50 54	2757	90 15 30	2741	88 39 44	2725	87 3 38	2710
25	SUN W.	121 23 23	2546	123 3 32	2531	124 44 2	2516	126 24 54	2502
	VENUS W.	77 9 27	2590	78 48 36	2572	80 28 8	2556	82 8 3	2540
	Spica W.	71 44 17	2251	73 31 28	2236	75 19 3	2221	77 7 0	2206
	JUPITER E.	30 0 8	2211	28 11 57	2199	26 23 28	2188	24 34 41	2179
	Fomalhaut E.	60 8 16	2467	58 26 16	2462	56 44 10	2458	55 1 57	2456
	α Pegasi E.	78 58 33	2850	77 20 46	2841	75 42 47	2833	74 4 37	2826
26	SUN W.	134 53 56	2438	136 36 37	2428	138 19 32	2417	140 2 43	2408
	VENUS W.	90 32 53	2468	92 14 51	2454	93 57 7	2443	95 39 41	2430
	Spica W.	86 12 9	2138	88 2 10	2125	89 52 31	2114	91 43 9	2103
	Antares W.	40 20 19	2160	42 9 47	2144	43 59 39	2130	45 49 53	2116
	Fomalhaut E.	46 31 1	2476	44 49 14	2468	43 7 45	2504	41 26 37	2525
	α Pegasi E.	65 52 18	2618	64 13 48	2602	62 35 23	2589	60 57 7	2578
27	VENUS W.	104 16 27	2381	106 0 29	2373	107 44 43	2366	109 29 7	2359
	Spica W.	101 0 15	2057	102 52 21	2050	104 44 38	2043	106 37 5	2037
	Antares W.	55 5 51	2060	56 57 52	2052	58 50 6	2043	60 42 35	2035
	Fomalhaut E.	33 10 59	2739	31 35 1	2692	30 0 36	2682	28 28 7	2669
	α Pegasi E.	52 50 5	2729	51 14 4	2700	49 38 43	2705	48 4 8	2696
	α Arietis E.	93 12 49	2151	91 23 7	2143	89 33 14	2136	87 43 9	2130
28	Spica W.	116 1 7	2021	117 54 9	2021	119 47 11	2020	121 40 14	2021
	Antares W.	70 7 18	2010	72 0 35	2009	73 53 56	2007	75 47 19	2006
	α Arietis E.	78 31 1	2115	76 40 25	2115	74 49 48	2116	72 59 14	2118
	Aldebaran E.	109 5 10	2001	107 11 38	2000	105 18 3	1998	103 24 25	1998
29	Antares W.	85 14 9	2015	87 7 20	2019	89 0 24	2023	90 53 23	2030
	α Aquilæ W.	46 55 56	2023	48 14 6	2031	49 33 56	2045	50 55 15	2079
	JUPITER W.	30 20 25	1986	32 14 22	1988	34 8 16	1991	36 2 4	1998
	α Arietis E.	63 47 48	2148	61 58 2	2157	60 8 30	2169	58 19 15	2180
	Aldebaran E.	93 56 28	2007	92 3 4	2010	90 9 46	2015	88 16 35	2021
30	Antares W.	100 15 32	2070	102 7 18	2079	103 58 49	2091	105 50 2	2102
	α Aquilæ W.	57 59 19	2136	59 26 45	2104	60 54 50	2077	62 23 28	2054
	JUPITER W.	45 28 49	2032	47 21 34	2041	49 14 4	2051	51 6 19	2062
	α Arietis E.	49 18 27	2209	47 31 42	2202	45 45 31	2218	43 59 58	2246
	Aldebaran E.	78 53 22	2002	77 1 24	2071	75 9 40	2083	73 18 14	2094
31	α Aquilæ W.	69 52 6	2293	71 22 27	2290	72 52 52	2289	74 23 19	2290
	JUPITER W.	60 23 0	2126	62 13 19	2140	61 3 17	2155	65 52 53	2171
	α Arietis E.	35 24 5	2546	33 43 56	2609	32 5 1	2661	30 27 23	2722
	Aldebaran E.	64 5 46	2161	62 16 19	2176	60 27 16	2191	58 38 35	2208

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.	
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		^h ^m ^s	^s	[°] ['] ["]	["]	['] ["]				
Mon.	1	10 42 15.05	9.066	N. 8 12 54.8	-54.50	15 53.73	64.40	^m ^s 0 9.08	^s 0.788	
Tues.	2	10 45 52.49	9.055	7 51 2.9	54.83	15 53.96	64.36	0 28.15	0.799	
Wed.	3	10 49 29.66	9.044	7 29 3.4	55.14	15 54.19	64.32	0 47.48	0.810	
Thur.	4	10 53 6.59	9.034	7 6 56.5	-55.43	15 54.42	64.28	1 7.06	0.820	
Frid.	5	10 56 43.29	9.025	6 44 42.6	55.72	15 54.66	64.25	1 26.86	0.829	
Sat.	6	11 0 19.78	9.017	6 22 22.0	56.01	15 54.89	64.22	1 46.86	0.837	
SUN.	7	11 3 56.09	9.009	5 59 54.9	-56.26	15 55.13	64.19	2 7.04	0.845	
Mon.	8	11 7 32.23	9.002	5 37 21.7	56.51	15 55.37	64.16	2 27.40	0.852	
Tues.	9	11 11 8.22	8.996	5 14 42.8	56.74	15 55.61	64.14	2 47.91	0.858	
Wed.	10	11 14 44.07	8.991	4 51 58.3	-56.96	15 55.86	64.12	3 8.56	0.863	
Thur.	11	11 18 19.80	8.986	4 29 8.9	57.15	15 56.11	64.10	3 29.33	0.868	
Frid.	12	11 21 55.43	8.982	4 6 14.6	57.34	15 56.36	64.08	3 50.20	0.872	
Sat.	13	11 25 30.97	8.979	3 43 16.0	-57.52	15 56.61	64.07	4 11.15	0.875	
SUN.	14	11 29 6.44	8.977	3 20 13.2	57.69	15 56.87	64.06	4 32.17	0.877	
Mon.	15	11 32 41.96	8.975	2 57 6.7	57.84	15 57.13	64.05	4 53.25	0.879	
Tues.	16	11 36 17.24	8.974	2 33 56.8	-57.97	15 57.39	64.05	5 14.37	0.880	
Wed.	17	11 39 52.59	8.973	2 10 44.0	58.08	15 57.66	64.05	5 35.51	0.881	
Thur.	18	11 43 27.94	8.974	1 47 28.5	58.18	15 57.93	64.05	5 56.65	0.880	
Frid.	19	11 47 3.32	8.975	1 24 10.8	-58.27	15 58.20	64.06	6 17.77	0.879	
Sat.	20	11 50 38.73	8.976	1 0 51.1	58.34	15 58.47	64.07	6 38.86	0.877	
SUN.	21	11 54 14.18	8.979	0 37 29.9	58.40	15 58.74	64.08	6 59.90	0.875	
Mon.	22	11 57 49.70	8.982	N. 0 14 7.4	-58.45	15 59.01	64.10	7 20.88	0.872	
Tues.	23	12 1 25.31	8.986	S. 0 9 15.8	58.48	15 59.29	64.12	7 41.76	0.868	
Wed.	24	12 5 1.04	8.992	0 32 39.7	58.50	15 59.56	64.14	8 2.53	0.862	
Thur.	25	12 8 36.91	8.998	0 56 3.7	-58.50	15 59.84	64.16	8 23.16	0.856	
Frid.	26	12 12 12.94	9.005	1 19 27.6	58.49	16 0.11	64.18	8 43.63	0.849	
Sat.	27	12 15 49.15	9.013	1 42 51.0	58.46	16 0.39	64.21	9 3.92	0.841	
SUN.	28	12 19 25.56	9.022	2 6 13.7	-58.42	16 0.66	64.24	9 24.01	0.833	
Mon.	29	12 23 2.20	9.032	2 29 35.3	58.36	16 0.94	64.28	9 43.85	0.823	
Tues.	30	12 26 39.10	9.044	2 52 55.4	58.29	16 1.21	64.32	10 3.46	0.810	
Wed.	31	12 30 16.28	9.056	S. 3 16 13.7	-58.22	16 1.49	64.36	10 22.79	0.798	

NOTE.—The mean time of semidiameter passing may be found by subtracting 0°.18 from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Mon.	1	^h 10 ^m 42 ^s 15.07	9.068	N. 8° 12' 54.7"	-54.51	^m 0 9.08	0.788	^h 10 42 21.16
Tues.	2	10 45 52.56	9.057	7 51 2.5	54.84	0 28.15	0.799	10 46 20.71
Wed.	3	10 49 29.78	9.046	7 29 2.7	55.15	0 47.49	0.810	10 50 17.27
Thur.	4	10 53 6.76	9.036	7 6 55.5	-55.44	1 7.07	0.820	10 54 13.62
Frid.	5	10 56 43.51	9.027	6 44 41.3	55.73	1 26.87	0.829	10 58 10.38
Sat.	6	11 0 20.05	9.019	6 22 20.4	56.01	1 46.88	0.837	11 2 6.93
SUN.	7	11 3 56.41	9.011	5 59 53.0	-56.27	2 7.07	0.845	11 6 3.48
Mon.	8	11 7 32.60	9.004	5 37 19.5	56.52	2 27.43	0.852	11 10 0.03
Tues.	9	11 11 8.64	8.998	5 14 40.2	56.75	2 47.95	0.858	11 13 56.59
Wed.	10	11 14 44.54	8.993	4 51 55.4	-56.97	3 8.60	0.863	11 17 53.14
Thur.	11	11 18 20.32	8.988	4 29 5.6	57.17	3 29.38	0.868	11 21 49.70
Frid.	12	11 21 56.00	8.984	4 6 11.0	57.36	3 50.25	0.872	11 25 46.25
Sat.	13	11 25 31.59	8.981	3 43 12.0	-57.54	4 11.21	0.875	11 29 42.80
SUN.	14	11 29 7.12	8.979	3 20 8.9	57.71	4 32.23	0.877	11 33 39.35
Mon.	15	11 32 42.59	8.977	2 57 2.0	57.86	4 53.32	0.879	11 37 35.91
Tues.	16	11 36 18.02	8.976	2 33 51.8	-57.99	5 14.44	0.880	11 41 32.46
Wed.	17	11 39 53.43	8.975	2 10 38.6	58.10	5 35.59	0.881	11 45 29.02
Thur.	18	11 43 28.83	8.976	1 47 22.8	58.20	5 56.74	0.880	11 49 25.57
Frid.	19	11 47 4.26	8.977	1 24 4.7	-58.29	6 17.86	0.879	11 53 22.12
Sat.	20	11 50 39.72	8.979	1 0 44.7	58.36	6 38.95	0.877	11 57 18.67
SUN.	21	11 54 15.22	8.981	0 37 23.1	58.42	7 0.00	0.875	12 1 15.22
Mon.	22	11 57 50.79	8.984	N. 0 14 0.3	-58.47	7 20.98	0.872	12 5 11.77
Tues.	23	12 1 26.46	8.988	S. 0 9 23.3	58.50	7 41.87	0.868	12 9 8.33
Wed.	24	12 5 2.25	8.994	0 32 47.5	58.52	8 2.64	0.862	12 13 4.88
Thur.	25	12 8 38.17	9.000	0 56 11.9	-58.52	8 23.27	0.856	12 17 1.44
Frid.	26	12 12 14.24	9.007	1 19 36.1	58.51	8 43.75	0.849	12 20 57.99
Sat.	27	12 15 50.50	9.015	1 42 59.9	58.48	9 4.04	0.841	12 24 54.54
SUN.	28	12 19 26.97	9.024	2 6 22.9	-58.44	9 24.12	0.832	12 28 51.09
Mon.	29	12 23 3.67	9.034	2 29 44.8	58.38	9 43.98	0.822	12 32 47.65
Tues.	30	12 26 40.62	9.046	2 53 5.3	58.31	10 3.59	0.810	12 36 44.20
Wed.	31	12 30 17.85	9.058	S. 3 16 23.8	-58.23	10 22.91	0.798	12 40 40.76

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
+ 9".8565.
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		λ	λ'						
1	244	158° 57' 56.3	57' 38.8	145.24	— 0.64	0.0037483	—43.2	13 ^h 15 ^m 25.17 ^s	
2	245	159 56 2.9	55 45.3	145.31	0.59	0.0036443	43.5	13 11 29.26	
3	246	160 54 11.4	53 53.7	145.39	0.52	0.0035396	43.8	13 7 33.36	
4	247	161 52 21.8	52 4.0	145.47	— 0.42	0.0034342	—44.1	13 3 37.45	
5	248	162 50 34.3	50 16.4	145.56	0.30	0.0033280	44.5	12 59 41.54	
6	249	163 48 48.8	48 30.8	145.64	0.17	0.0032209	44.8	12 55 45.63	
7	250	164 47 5.3	46 47.2	145.73	— 0.04	0.0031129	—45.2	12 51 49.72	
8	251	165 45 23.8	45 5.6	145.81	+ 0.09	0.0030039	45.6	12 47 53.82	
9	252	166 43 44.4	43 26.1	145.90	0.20	0.0028938	46.1	12 43 57.91	
10	253	167 42 7.1	41 48.7	145.99	+ 0.30	0.0027825	—46.6	12 40 2.00	
11	254	168 40 31.9	40 13.4	146.07	0.37	0.0026698	47.2	12 36 6.10	
12	255	169 38 58.7	38 40.1	146.15	0.42	0.0025557	47.8	12 32 10.20	
13	256	170 37 27.4	37 8.7	146.24	+ 0.45	0.0024403	—48.4	12 28 14.29	
14	257	171 35 58.1	35 39.3	146.32	0.44	0.0023235	49.0	12 24 18.38	
15	258	172 34 30.7	34 11.8	146.40	0.40	0.0022054	49.5	12 20 22.47	
16	259	173 33 5.1	32 46.1	146.48	+ 0.33	0.0020859	—50.0	12 16 26.56	
17	260	174 31 41.3	31 22.2	146.55	0.24	0.0019652	50.5	12 12 30.65	
18	261	175 30 19.2	30 0.0	146.62	+ 0.13	0.0018435	50.9	12 8 34.74	
19	262	176 28 58.9	28 39.6	146.69	0.00	0.0017208	—51.3	12 4 38.84	
20	263	177 27 40.3	27 20.9	146.76	— 0.13	0.0015973	51.7	12 0 42.93	
21	264	178 26 23.3	26 3.8	146.83	0.27	0.0014731	51.8	11 56 47.02	
22	265	179 25 8.0	24 48.4	146.90	— 0.40	0.0013484	—52.0	11 52 51.11	
23	266	180 23 54.4	23 34.7	146.96	0.51	0.0012233	52.2	11 48 55.21	
24	267	181 22 42.6	22 22.8	147.04	0.60	0.0010980	52.2	11 44 59.31	
25	268	182 21 32.5	21 12.6	147.11	— 0.68	0.0009728	—52.2	11 41 3.40	
26	269	183 20 24.2	20 4.2	147.19	0.73	0.0008477	52.1	11 37 7.49	
27	270	184 19 17.8	18 57.7	147.27	0.74	0.0007228	52.0	11 33 11.58	
28	271	185 18 13.3	17 53.1	147.36	— 0.72	0.0005982	—51.9	11 29 15.68	
29	272	186 17 10.7	16 50.4	147.44	0.68	0.0004739	51.7	11 25 19.77	
30	273	187 16 10.2	15 49.8	147.52	0.60	0.0003499	51.6	11 21 23.86	
31	274	188 15 11.8	14 51.3	147.61	— 0.50	0.0002264	—51.4	11 17 27.96	
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .									Diff. for 1 Hour. — 9 ^m .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI- DIAMETER.

HORIZONTAL PARALLAX.

UPPER TRANSIT.

AGE.

Noon.

Midnight.

Noon.

Diff. for
1 Hour.

Midnight.

Diff. for
1 Hour.Meridian of
Greenwich.Diff. for
1 Hour.

Noon.

1	16' 19.5	16' 12.4	59' 48.0	-2.08	59' 22.0	-2.24	14 35.3	2.07	16.8
2	16' 4.9	15 57.1	58 54.4	2.35	58 25.8	2.40	15 24.4	2.04	17.8
3	15 49.2	15 41.5	57 56.9	2.40	57 28.4	2.35	16 13.3	2.05	18.8
4	15 33.9	15 26.7	57 0.7	-2.26	56 34.2	-2.15	17 2.7	2.07	19.8
5	15 19.9	15 13.7	56 9.3	2.00	55 46.4	1.84	17 52.7	2.09	20.8
6	15 8.0	15 2.9	55 25.5	1.65	55 6.9	1.45	18 43.3	2.11	21.8
7	14 58.5	14 54.7	54 50.7	-1.26	54 36.8	-1.07	19 33.9	2.10	22.8
8	14 51.6	14 49.1	54 25.2	0.87	54 16.0	0.68	20 24.0	2.06	23.8
9	14 47.2	14 45.8	54 9.0	0.50	54 4.2	-0.32	21 12.7	2.00	24.8
10	14 45.1	14 44.9	54 1.5	-0.15	54 0.7	+0.01	21 59.8	1.92	25.8
11	14 45.2	14 45.9	54 1.7	+0.16	54 4.3	0.29	22 44.9	1.84	26.8
12	14 47.0	14 48.6	54 8.5	0.41	54 14.1	0.52	23 28.4	1.79	27.8
13	14 50.4	14 52.6	54 20.9	+0.63	54 29.0	+0.72	δ		28.8
14	14 55.1	14 57.8	54 38.1	0.80	54 48.2	0.88	0 10.8	1.75	0.2
15	15 0.8	15 4.1	54 59.2	0.96	55 11.1	1.04	0 52.6	1.75	1.2
16	15 7.6	15 11.3	55 23.9	+1.10	55 37.6	+1.17	1 34.9	1.79	2.2
17	15 15.2	15 19.4	55 52.0	1.24	56 7.3	1.31	2 18.4	1.86	3.2
18	15 23.7	15 28.3	56 23.3	1.38	56 40.2	1.44	3 4.0	1.96	4.2
19	15 33.1	15 38.1	56 57.8	+1.50	57 16.2	+1.56	3 52.8	2.11	5.2
20	15 43.3	15 48.6	57 35.2	1.61	57 54.7	1.64	4 45.4	2.26	6.2
21	15 54.0	15 59.4	58 14.5	1.66	58 34.4	1.65	5 41.7	2.41	7.2
22	16 4.8	16 10.0	58 54.1	+1.63	59 13.3	+1.56	6 41.2	2.51	8.2
23	16 15.0	16 19.6	59 31.5	1.47	59 48.4	1.34	7 42.2	2.53	9.2
24	16 23.7	16 27.1	60 3.4	1.16	60 16.1	0.95	8 42.8	2.48	10.2
25	16 29.8	16 31.7	60 26.1	+0.70	60 32.8	+0.41	9 41.3	2.38	11.2
26	16 32.5	16 32.3	60 36.0	+0.11	60 35.3	-0.22	10 37.1	2.27	12.2
27	16 31.1	16 28.8	60 30.7	-0.55	60 22.2	0.87	11 30.2	2.17	13.2
28	16 25.4	16 21.1	60 9.9	-1.18	59 54.0	-1.46	12 21.4	2.11	14.2
29	16 15.9	16 10.0	59 35.0	1.70	59 13.3	1.90	13 11.6	2.09	15.2
30	16 3.5	15 56.6	58 49.4	2.05	58 24.1	2.15	14 1.6	2.09	16.2
31	15 49.5	15 42.2	57 57.8	-2.20	57 31.3	-2.21	14 52.0	2.12	17.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	48 26.68	2.1895	0 6 18.3	15.156	0	31 39.02	2.1399	11 27 16.3	12.758
1	50 37.97	2.1899	0 21 27.1	15.137	1	33 47.00	2.1331	11 39 59.5	12.623
2	52 49.11	2.1845	0 36 34.7	15.116	2	35 54.90	2.1333	11 52 38.1	12.604
3	55 0.11	2.1621	0 51 41.0	15.093	3	38 2.99	2.1335	12 5 12.0	12.596
4	57 10.96	2.1706	1 6 45.9	15.069	4	40 11.01	2.1338	12 17 41.2	12.447
5	59 21.66	2.1772	1 21 49.3	15.043	5	42 19.05	2.1341	12 30 5.6	12.367
6	1 1 32.22	2.1749	1 36 51.1	15.017	6	44 27.10	2.1344	12 42 25.2	12.366
7	1 3 42.64	2.1797	1 51 51.3	14.989	7	46 35.18	2.1348	12 54 39.9	12.304
8	1 5 52.94	2.1708	2 6 49.8	14.959	8	48 43.28	2.1352	13 6 49.7	12.191
9	1 8 3.11	2.1684	2 21 46.4	14.928	9	50 51.41	2.1357	13 18 54.4	12.037
10	1 10 13.15	2.1662	2 36 41.1	14.895	10	52 59.56	2.1361	13 30 54.1	11.952
11	1 12 23.07	2.1644	2 51 33.8	14.861	11	55 7.74	2.1366	13 42 48.7	11.867
12	1 14 32.88	2.1625	3 6 24.4	14.826	12	57 15.96	2.1372	13 54 38.2	11.768
13	1 16 42.57	2.1607	3 21 12.9	14.789	13	59 24.21	2.1378	14 6 22.5	11.665
14	1 18 52.16	2.1589	3 35 59.1	14.751	14	3 1 32.50	2.1385	14 18 1.6	11.607
15	1 21 1.64	2.1572	3 50 43.0	14.712	15	3 3 40.83	2.1392	14 29 35.4	11.519
16	1 23 11.02	2.1555	4 5 24.6	14.671	16	3 5 49.20	2.1398	14 41 3.9	11.431
17	1 25 20.30	2.1539	4 20 3.6	14.628	17	3 7 57.61	2.1406	14 52 27.1	11.341
18	1 27 29.49	2.1524	4 34 40.0	14.585	18	3 10 6.07	2.1414	15 3 44.8	11.250
19	1 29 38.59	2.1509	4 49 13.8	14.542	19	3 12 14.58	2.1422	15 14 57.1	11.159
20	1 31 47.60	2.1495	5 3 45.0	14.497	20	3 14 23.13	2.1429	15 26 3.9	11.065
21	1 33 56.58	2.1482	5 18 13.4	14.449	21	3 16 31.73	2.1437	15 37 5.1	10.973
22	1 36 5.38	2.1469	5 32 38.9	14.401	22	3 18 40.38	2.1446	15 48 0.7	10.880
23	1 38 14.16	2.1457	N. 5 47 1.5	14.352	23	3 20 49.08	2.1455	N. 15 58 50.7	10.787
TUESDAY 2.					THURSDAY 4.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	40 22.87	2.1446	6 1 21.1	14.301	0	3 22 57.84	2.1464	16 9 35.1	10.693
1	42 31.51	2.1434	6 15 37.6	14.249	1	3 25 6.65	2.1473	16 20 13.8	10.597
2	44 40.08	2.1423	6 29 51.0	14.197	2	3 27 15.52	2.1483	16 30 46.7	10.500
3	46 48.59	2.1413	6 44 1.2	14.143	3	3 29 24.45	2.1493	16 41 13.8	10.403
4	48 57.04	2.1404	6 58 8.1	14.087	4	3 31 33.44	2.1503	16 51 35.1	10.306
5	51 5.44	2.1396	7 12 11.6	14.030	5	3 33 42.49	2.1512	17 1 50.5	10.208
6	53 13.79	2.1388	7 26 11.7	13.972	6	3 35 51.59	2.1522	17 12 0.0	10.109
7	55 22.09	2.1380	7 40 8.3	13.914	7	3 38 0.75	2.1533	17 22 3.6	10.010
8	57 30.35	2.1372	7 54 1.4	13.855	8	3 40 9.98	2.1544	17 32 1.2	9.909
9	59 38.56	2.1366	8 7 50.9	13.794	9	3 42 19.28	2.1555	17 41 52.7	9.808
10	2 1 46.74	2.1360	8 21 36.7	13.732	10	3 44 28.64	2.1566	17 51 38.2	9.707
11	2 3 54.88	2.1354	8 35 18.7	13.669	11	3 46 38.07	2.1577	18 1 17.6	9.606
12	2 6 2.99	2.1349	8 48 56.9	13.605	12	3 48 47.56	2.1588	18 10 50.9	9.503
13	2 8 11.07	2.1345	9 2 31.3	13.540	13	3 50 57.12	2.1599	18 20 18.0	9.400
14	2 10 19.13	2.1342	9 16 1.7	13.473	14	3 53 6.75	2.1610	18 29 38.9	9.297
15	2 12 27.17	2.1338	9 29 28.1	13.406	15	3 55 16.44	2.1621	18 38 53.6	9.193
16	2 14 35.19	2.1335	9 42 50.4	13.338	16	3 57 26.20	2.1632	18 48 2.1	9.089
17	2 16 43.19	2.1332	9 56 8.6	13.269	17	3 59 36.03	2.1644	18 57 4.3	8.984
18	2 18 51.18	2.1331	10 9 22.7	13.200	18	4 1 45.93	2.1656	19 6 0.2	8.878
19	2 20 59.16	2.1330	10 22 32.6	13.129	19	4 3 55.90	2.1667	19 14 49.7	8.772
20	2 23 7.14	2.1329	10 35 38.2	13.057	20	4 6 5.94	2.1679	19 23 32.8	8.665
21	2 25 15.11	2.1328	10 48 39.4	12.983	21	4 8 16.05	2.1691	19 32 9.5	8.557
22	2 27 23.08	2.1328	11 1 36.2	12.909	22	4 10 26.23	2.1702	19 40 39.7	8.449
23	2 29 31.05	2.1328	11 14 28.5	12.834	23	4 12 36.48	2.1713	19 49 3.4	8.341
24	2 31 39.02	2.1329	N. 11 27 16.3	12.758	24	4 14 46.79	2.1725	N. 19 57 20.6	8.232

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	^h 4 ^m 14 ^s 46.79	2.1735	N.19° 57' 20.6"	8.939	0	^h 6 ^m 0 ^s 7.13	2.9065	N.24° 20' 6.8"	2.614
1	4 16 57.18	2.1737	20 5 31.3	8.193	1	6 2 19.52	2.9064	24 22 40.0	2.499
2	4 19 7.64	2.1748	20 13 35.4	8.013	2	6 4 31.90	2.9063	24 25 5.9	2.371
3	4 21 18.16	2.1759	20 21 32.9	7.903	3	6 6 44.27	2.9061	24 27 24.5	2.249
4	4 23 28.75	2.1771	20 29 23.8	7.793	4	6 8 56.63	2.9058	24 29 35.8	2.197
5	4 25 39.41	2.1782	20 37 8.1	7.683	5	6 11 8.97	2.9056	24 31 39.8	2.095
6	4 27 50.14	2.1794	20 44 45.7	7.571	6	6 13 21.30	2.9053	24 33 36.4	1.983
7	4 30 0.94	2.1805	20 52 16.6	7.456	7	6 15 33.61	2.9049	24 35 25.7	1.789
8	4 32 11.80	2.1816	20 59 40.7	7.346	8	6 17 45.89	2.9045	24 37 7.8	1.641
9	4 34 22.73	2.1827	21 6 58.1	7.233	9	6 19 58.15	2.9041	24 38 42.6	1.519
10	4 36 33.73	2.1838	21 14 8.7	7.190	10	6 22 10.38	2.9036	24 40 10.0	1.397
11	4 38 44.79	2.1848	21 21 12.5	7.097	11	6 24 22.58	2.9030	24 41 30.2	1.276
12	4 40 55.91	2.1859	21 28 9.6	6.994	12	6 26 34.74	2.9024	24 42 43.1	1.154
13	4 43 7.10	2.1870	21 34 59.8	6.779	13	6 28 46.87	2.9018	24 43 48.7	1.033
14	4 45 18.35	2.1880	21 41 43.1	6.664	14	6 30 58.96	2.9011	24 44 47.0	0.912
15	4 47 29.66	2.1890	21 48 19.5	6.549	15	6 33 11.00	2.9004	24 45 38.1	0.791
16	4 49 41.03	2.1900	21 54 49.0	6.434	16	6 35 23.00	2.1998	24 46 21.9	0.669
17	4 51 52.46	2.1909	22 1 11.6	6.318	17	6 37 34.95	2.1987	24 46 58.4	0.548
18	4 54 3.94	2.1918	22 7 27.2	6.202	18	6 39 46.84	2.1978	24 47 27.7	0.426
19	4 56 15.48	2.1928	22 13 35.9	6.086	19	6 41 58.68	2.1969	24 47 49.7	0.307
20	4 58 27.08	2.1937	22 19 37.6	5.969	20	6 44 10.47	2.1960	24 48 4.5	0.187
21	5 0 38.73	2.1946	22 25 32.2	5.852	21	6 46 22.20	2.1949	24 48 12.1	+ 0.067
22	5 2 50.43	2.1954	22 31 19.8	5.735	22	6 48 33.86	2.1938	24 48 12.5	- 0.064
23	5 5 2.18	2.1963	N.22° 37' 0.4"	5.617	23	6 50 45.46	2.1927	N.24° 48' 5.6"	0.175
SATURDAY 6.					MONDAY 8.				
0	5 7 13.99	2.1971	N.22° 42' 33.9"	5.499	0	6 52 56.99	2.1916	N.24° 47' 51.5"	0.396
1	5 9 25.84	2.1979	22 48 0.3	5.382	1	6 55 8.45	2.1903	24 47 30.2	0.414
2	5 11 37.74	2.1986	22 53 19.7	5.264	2	6 57 19.83	2.1891	24 47 1.8	0.533
3	5 13 49.68	2.1993	22 58 32.0	5.146	3	6 59 31.14	2.1878	24 46 26.2	0.652
4	5 16 1.66	2.2000	23 3 37.1	5.028	4	7 1 42.37	2.1865	24 45 43.5	0.771
5	5 18 13.68	2.2007	23 8 35.1	4.907	5	7 3 53.52	2.1853	24 44 53.7	0.890
6	5 20 25.75	2.2014	23 13 26.0	4.788	6	7 6 4.59	2.1839	24 43 56.7	1.009
7	5 22 37.85	2.2019	23 18 9.7	4.668	7	7 8 15.57	2.1823	24 42 52.6	1.127
8	5 24 49.98	2.2025	23 22 46.2	4.549	8	7 10 26.46	2.1807	24 41 41.4	1.245
9	5 27 2.15	2.2031	23 27 15.6	4.430	9	7 12 37.25	2.1791	24 40 23.2	1.362
10	5 29 14.35	2.2036	23 31 37.8	4.309	10	7 14 47.95	2.1775	24 38 57.9	1.480
11	5 31 26.58	2.2040	23 35 52.7	4.188	11	7 16 58.55	2.1758	24 37 25.6	1.598
12	5 33 38.83	2.2044	23 40 0.4	4.066	12	7 19 9.04	2.1740	24 35 46.2	1.715
13	5 35 51.11	2.2048	23 44 0.9	3.947	13	7 21 19.43	2.1723	24 33 59.8	1.831
14	5 38 3.41	2.2052	23 47 54.1	3.827	14	7 23 29.72	2.1706	24 32 6.5	1.947
15	5 40 15.73	2.2055	23 51 40.1	3.706	15	7 25 39.90	2.1688	24 30 6.2	2.063
16	5 42 28.07	2.2057	23 55 18.8	3.585	16	7 27 49.97	2.1669	24 27 58.9	2.179
17	5 44 40.42	2.2060	23 58 50.3	3.464	17	7 29 59.93	2.1650	24 25 44.7	2.294
18	5 46 52.79	2.2062	24 2 14.5	3.342	18	7 32 9.77	2.1630	24 23 23.6	2.409
19	5 49 5.17	2.2064	24 5 31.4	3.221	19	7 34 19.49	2.1610	24 20 55.6	2.524
20	5 51 17.56	2.2065	24 8 41.0	3.100	20	7 36 29.09	2.1590	24 18 20.7	2.638
21	5 53 29.95	2.2066	24 11 43.4	2.979	21	7 38 38.57	2.1569	24 15 39.0	2.752
22	5 55 42.35	2.2066	24 14 38.5	2.857	22	7 40 47.92	2.1548	24 12 50.5	2.865
23	5 57 54.74	2.2065	24 17 26.3	2.736	23	7 42 57.15	2.1527	24 9 55.2	2.978
24	6 0 7.13	2.2065	N.24° 20' 6.8"	2.614	24	7 45 6.25	2.1505	N.24° 6' 53.1"	3.091

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	7 45 6.25	2.1505	N.24 6 53.1	3.091	0	9 25 18.36	2.0183	N.19 37 52.2	7.905
1	7 47 15.21	2.1483	24 3 44.3	3.303	1	9 27 19.37	2.0153	19 29 55.3	7.991
2	7 49 24.04	2.1461	24 0 28.8	3.315	2	9 29 20.20	2.0134	19 21 53.3	8.076
3	7 51 32.74	2.1438	23 57 6.5	3.497	3	9 31 20.86	2.0095	19 13 46.2	8.160
4	7 53 41.30	2.1414	23 53 37.6	3.538	4	9 33 21.34	2.0065	19 5 34.1	8.244
5	7 55 49.71	2.1390	23 50 2.0	3.648	5	9 35 21.64	2.0036	18 57 16.9	8.398
6	7 57 57.98	2.1366	23 46 19.8	3.758	6	9 37 21.77	2.0007	18 48 54.7	8.411
7	8 0 6.11	2.1342	23 42 31.0	3.888	7	9 39 21.72	1.9977	18 40 27.6	8.492
8	8 2 14.09	2.1318	23 38 35.6	3.977	8	9 41 21.50	1.9948	18 31 55.7	8.573
9	8 4 21.93	2.1294	23 34 33.7	4.086	9	9 43 21.10	1.9919	18 23 18.9	8.653
10	8 6 29.62	2.1269	23 30 25.3	4.194	10	9 45 20.53	1.9891	18 14 37.3	8.739
11	8 8 37.15	2.1243	23 26 10.4	4.302	11	9 47 19.79	1.9863	18 5 51.0	8.812
12	8 10 44.53	2.1218	23 21 49.0	4.410	12	9 49 18.87	1.9833	17 56 59.9	8.891
13	8 12 51.76	2.1192	23 17 21.2	4.517	13	9 51 17.78	1.9804	17 48 4.1	8.968
14	8 14 58.83	2.1165	23 12 47.0	4.623	14	9 53 16.52	1.9777	17 39 3.7	9.045
15	8 17 5.74	2.1138	23 8 6.5	4.728	15	9 55 15.10	1.9749	17 29 58.7	9.122
16	8 19 12.49	2.1112	23 3 19.6	4.834	16	9 57 13.51	1.9721	17 20 49.1	9.197
17	8 21 19.08	2.1085	22 58 26.4	4.939	17	9 59 11.75	1.9693	17 11 35.0	9.272
18	8 23 25.51	2.1058	22 53 26.9	5.043	18	10 1 9.82	1.9665	17 2 16.5	9.346
19	8 25 31.78	2.1031	22 48 21.2	5.147	19	10 3 7.73	1.9638	16 52 53.5	9.420
20	8 27 37.88	2.1003	22 43 9.3	5.250	20	10 5 5.48	1.9611	16 43 26.1	9.493
21	8 29 43.82	2.0976	22 37 51.2	5.353	21	10 7 3.06	1.9583	16 33 54.3	9.566
22	8 31 49.59	2.0948	22 32 26.9	5.456	22	10 9 0.48	1.9557	16 24 18.2	9.637
23	8 33 55.19	2.0919	N.22 26 56.5	5.557	23	10 10 57.75	1.9531	N.16 14 37.9	9.707
WEDNESDAY 10.					FRIDAY 12.				
0	8 36 0.62	2.0891	N.22 21 20.1	5.658	0	10 12 54.86	1.9505	N.16 4 53.4	9.777
1	8 38 5.88	2.0862	22 15 37.6	5.758	1	10 14 51.81	1.9479	15 55 4.7	9.847
2	8 40 10.97	2.0834	22 9 49.1	5.858	2	10 16 48.61	1.9453	15 45 11.8	9.916
3	8 42 15.89	2.0805	22 3 54.6	5.958	3	10 18 45.25	1.9427	15 35 14.8	9.983
4	8 44 20.63	2.0776	21 57 54.1	6.056	4	10 20 41.74	1.9409	15 25 13.8	10.050
5	8 46 25.20	2.0747	21 51 47.8	6.154	5	10 22 38.08	1.9377	15 15 8.8	10.117
6	8 48 29.60	2.0718	21 45 35.6	6.252	6	10 24 34.27	1.9359	15 4 59.8	10.189
7	8 50 33.82	2.0689	21 39 17.6	6.349	7	10 26 30.31	1.9338	14 54 46.9	10.247
8	8 52 37.87	2.0660	21 32 53.7	6.446	8	10 28 26.21	1.9305	14 44 30.1	10.312
9	8 54 41.74	2.0630	21 26 24.0	6.542	9	10 30 21.97	1.9281	14 34 9.5	10.375
10	8 56 45.43	2.0600	21 19 48.6	6.637	10	10 32 17.58	1.9257	14 23 45.1	10.438
11	8 58 48.94	2.0571	21 13 7.6	6.731	11	10 34 13.05	1.9234	14 13 16.9	10.501
12	9 0 52.28	2.0542	21 6 20.9	6.826	12	10 36 8.39	1.9219	14 2 45.0	10.569
13	9 2 55.44	2.0512	20 59 28.5	6.919	13	10 38 3.59	1.9189	13 52 9.5	10.633
14	9 4 58.42	2.0482	20 52 30.6	7.012	14	10 39 58.66	1.9166	13 41 30.3	10.693
15	9 7 1.22	2.0452	20 45 27.1	7.104	15	10 41 53.59	1.9144	13 30 47.5	10.749
16	9 9 3.84	2.0422	20 38 18.1	7.196	16	10 43 48.39	1.9123	13 20 1.2	10.801
17	9 11 6.28	2.0392	20 31 3.6	7.287	17	10 45 43.07	1.9102	13 9 11.4	10.858
18	9 13 8.54	2.0362	20 23 43.7	7.377	18	10 47 37.62	1.9082	12 58 18.2	10.915
19	9 15 10.62	2.0332	20 16 18.4	7.467	19	10 49 32.05	1.9062	12 47 21.6	10.972
20	9 17 12.52	2.0302	20 8 47.7	7.556	20	10 51 26.36	1.9041	12 36 21.6	11.028
21	9 19 14.25	2.0273	20 1 11.7	7.644	21	10 53 20.54	1.9021	12 25 18.3	11.083
22	9 21 15.80	2.0243	19 53 30.4	7.731	22	10 55 14.61	1.9002	12 14 11.7	11.138
23	9 23 17.17	2.0213	19 45 43.9	7.818	23	10 57 8.56	1.8983	12 3 1.8	11.192
24	9 25 18.36	2.0183	N.19 37 52.2	7.905	24	10 59 2.40	1.8964	N.11 51 48.7	11.244

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	^h 10 ^m 59 ^s 2.40	1.8664	N. 11° 51' 48.7	11.944	0	^h 12 ^m 28 ^s 45.48	1.8666	N. 2° 5' 35.3	12.869
1	11 0 56.13	1.8646	11 40 32.5	11.926	1	12 30 37.13	1.8611	1 52 41.5	12.904
2	11 2 49.75	1.8628	11 29 13.2	11.947	2	12 32 28.81	1.8617	1 39 46.8	12.919
3	11 4 43.27	1.8611	11 17 50.9	11.967	3	12 34 20.53	1.8623	1 26 51.2	12.933
4	11 6 36.68	1.8694	11 6 25.6	11.447	4	12 36 12.29	1.8630	1 13 54.8	12.946
5	11 8 29.99	1.8677	10 54 57.3	11.496	5	12 38 4.09	1.8637	1 0 57.7	12.957
6	11 10 23.20	1.8661	10 43 26.1	11.544	6	12 39 55.93	1.8644	0 47 59.9	12.968
7	11 12 16.32	1.8645	10 31 52.0	11.592	7	12 41 47.82	1.8653	0 35 1.5	12.978
8	11 14 9.34	1.8629	10 20 15.1	11.639	8	12 43 39.77	1.8663	0 22 2.5	12.988
9	11 16 2.27	1.8614	10 8 35.4	11.685	9	12 45 31.78	1.8673	N. 0 9 2.9	12.997
10	11 17 55.11	1.8600	9 56 52.9	11.730	10	12 47 23.85	1.8683	S. 0 3 57.2	13.006
11	11 19 47.87	1.8766	9 45 7.8	11.774	11	12 49 15.98	1.8694	0 16 57.8	13.013
12	11 21 40.54	1.8772	9 33 20.0	11.818	12	12 51 8.18	1.8706	0 29 58.8	13.019
13	11 23 33.13	1.8759	9 21 29.6	11.862	13	12 53 0.45	1.8718	0 43 0.1	13.024
14	11 25 25.65	1.8747	9 9 36.6	11.904	14	12 54 52.79	1.8730	0 56 1.7	13.029
15	11 27 18.09	1.8734	8 57 41.1	11.945	15	12 56 45.21	1.8743	1 9 3.6	13.032
16	11 29 10.46	1.8722	8 45 43.2	11.986	16	12 58 37.71	1.8757	1 22 5.6	13.035
17	11 31 2.76	1.8711	8 33 42.8	12.027	17	13 0 30.30	1.8771	1 35 7.8	13.037
18	11 32 54.99	1.8699	8 21 40.0	12.066	18	13 2 22.97	1.8786	1 48 10.1	13.039
19	11 34 47.15	1.8689	8 9 34.9	12.104	19	13 4 15.73	1.8802	2 1 12.5	13.039
20	11 36 39.26	1.8680	7 57 27.5	12.142	20	13 6 8.59	1.8819	2 14 14.8	13.038
21	11 38 31.31	1.8670	7 45 17.8	12.180	21	13 8 1.56	1.8833	2 27 17.0	13.036
22	11 40 23.30	1.8661	7 33 5.9	12.216	22	13 9 54.63	1.8853	2 40 19.1	13.034
23	11 42 15.24	1.8652	N. 7 20 51.9	12.251	23	13 11 47.80	1.8871	S. 2 53 21.1	13.032
SUNDAY 14.					TUESDAY 16.				
0	11 44 7.13	1.8644	N. 7 8 35.8	12.286	0	13 13 41.08	1.8890	S. 3 6 22.9	13.026
1	11 45 58.97	1.8637	6 56 17.6	12.320	1	13 15 34.48	1.8909	3 19 24.4	13.023
2	11 47 50.77	1.8630	6 43 57.4	12.353	2	13 17 27.99	1.8928	3 32 25.6	13.017
3	11 49 42.53	1.8623	6 31 35.2	12.386	3	13 19 21.62	1.8949	3 45 26.4	13.010
4	11 51 34.25	1.8617	6 19 11.0	12.418	4	13 21 15.38	1.8971	3 58 26.8	13.002
5	11 53 25.94	1.8611	6 6 45.0	12.448	5	13 23 9.27	1.8993	4 11 26.7	12.994
6	11 55 17.59	1.8606	5 54 17.2	12.478	6	13 25 3.29	1.9015	4 24 26.1	12.985
7	11 57 9.21	1.8602	5 41 47.6	12.508	7	13 26 57.45	1.9037	4 37 24.9	12.974
8	11 59 0.81	1.8598	5 29 16.2	12.537	8	13 28 51.74	1.9060	4 50 23.0	12.963
9	12 0 52.39	1.8595	5 16 43.1	12.565	9	13 30 46.17	1.9084	5 3 20.5	12.952
10	12 2 43.95	1.8592	5 4 8.4	12.592	10	13 32 40.75	1.9110	5 16 17.3	12.939
11	12 4 35.49	1.8589	4 51 32.1	12.618	11	13 34 35.49	1.9136	5 29 13.2	12.924
12	12 6 27.02	1.8587	4 38 54.2	12.644	12	13 36 30.38	1.9162	5 42 8.2	12.909
13	12 8 18.54	1.8586	4 26 14.8	12.668	13	13 38 25.43	1.9188	5 55 2.3	12.894
14	12 10 10.05	1.8584	4 13 34.0	12.692	14	13 40 20.64	1.9215	6 7 55.5	12.877
15	12 12 1.55	1.8584	4 0 51.7	12.716	15	13 42 16.01	1.9243	6 20 47.6	12.859
16	12 13 53.06	1.8585	3 48 8.0	12.739	16	13 44 11.55	1.9272	6 33 38.6	12.841
17	12 15 44.57	1.8585	3 35 23.0	12.760	17	13 46 7.27	1.9301	6 46 28.5	12.822
18	12 17 36.08	1.8586	3 22 36.8	12.780	18	13 48 3.16	1.9330	6 59 17.2	12.801
19	12 19 27.60	1.8588	3 9 49.4	12.800	19	13 49 59.23	1.9361	7 12 4.6	12.779
20	12 21 19.14	1.8591	2 57 0.8	12.820	20	13 51 55.49	1.9392	7 24 50.7	12.757
21	12 23 10.69	1.8594	2 44 11.0	12.839	21	13 53 51.93	1.9423	7 37 35.5	12.734
22	12 25 2.26	1.8596	2 31 20.1	12.857	22	13 55 48.56	1.9455	7 50 18.8	12.709
23	12 26 53.86	1.8602	2 18 28.2	12.873	23	13 57 45.39	1.9488	8 3 0.6	12.684
24	12 28 45.48	1.8606	N. 2 5 35.3	12.889	24	13 59 42.41	1.9521	S. 8 15 40.9	12.658

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff for 1 Minute.	Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	13 59 42.41	1.9591	S. 8° 15' 40.9	12.658	0	15 38 20.71	2.1778	S. 17° 32' 57.4	10.199
1	14 1 39.64	1.9555	8 28 19.6	12.631	1	15 40 31.55	2.1836	17 43 2.7	10.047
2	14 3 37.07	1.9559	8 40 56.6	12.603	2	15 42 42.74	2.1895	17 53 3.1	9.965
3	14 5 34.71	1.9625	8 53 31.8	12.572	3	15 44 54.29	2.1954	18 2 58.5	9.891
4	14 7 32.57	1.9661	9 6 5.2	12.549	4	15 47 6.19	2.2013	18 12 48.8	9.796
5	14 9 30.64	1.9697	9 18 36.9	12.519	5	15 49 18.45	2.2073	18 22 34.0	9.700
6	14 11 28.93	1.9734	9 31 6.7	12.489	6	15 51 31.07	2.2132	18 32 13.9	9.631
7	14 13 27.45	1.9771	9 43 34.5	12.446	7	15 53 44.04	2.2192	18 41 48.5	9.539
8	14 15 26.19	1.9809	9 56 0.2	12.411	8	15 55 57.38	2.2253	18 51 17.7	9.442
9	14 17 25.16	1.9848	10 8 23.8	12.376	9	15 58 11.08	2.2313	19 0 41.5	9.351
10	14 19 24.37	1.9887	10 20 45.3	12.340	10	16 0 25.14	2.2373	19 9 59.8	9.268
11	14 21 23.81	1.9927	10 33 4.6	12.309	11	16 2 39.56	2.2434	19 19 12.4	9.163
12	14 23 23.49	1.9968	10 45 21.6	12.263	12	16 4 54.35	2.2495	19 28 19.3	9.068
13	14 25 23.42	2.0009	10 57 36.2	12.224	13	16 7 9.50	2.2556	19 37 20.5	8.971
14	14 27 23.60	2.0051	11 9 48.5	12.184	14	16 9 25.02	2.2617	19 46 15.8	8.879
15	14 29 24.03	2.0093	11 21 58.3	12.149	15	16 11 40.91	2.2679	19 55 5.1	8.779
16	14 31 24.71	2.0136	11 34 5.5	12.099	16	16 13 57.17	2.2740	20 3 48.4	8.679
17	14 33 25.66	2.0180	11 46 10.2	12.056	17	16 16 13.79	2.2803	20 12 25.7	8.570
18	14 35 26.87	2.0224	11 58 12.2	12.011	18	16 18 30.79	2.2864	20 20 56.8	8.466
19	14 37 28.35	2.0268	12 10 11.5	11.965	19	16 20 48.16	2.2925	20 29 21.6	8.369
20	14 39 30.09	2.0312	12 22 8.0	11.917	20	16 23 5.89	2.2986	20 37 40.2	8.267
21	14 41 32.10	2.0358	12 34 1.6	11.869	21	16 25 23.99	2.3047	20 45 52.4	8.149
22	14 43 34.39	2.0405	12 45 52.3	11.820	22	16 27 42.46	2.3109	20 53 58.1	8.040
23	14 45 36.96	2.0452	S. 12° 57' 40.0	11.769	23	16 30 1.30	2.3171	S. 21° 1' 57.2	7.929
THURSDAY 18.					SATURDAY 20.				
0	14 47 39.81	2.0499	S. 13° 9' 24.6	11.717	0	16 32 20.51	2.3232	S. 21° 9' 49.6	7.818
1	14 49 42.95	2.0547	13 21 6.1	11.665	1	16 34 40.09	2.3294	21 17 35.3	7.706
2	14 51 46.38	2.0595	13 32 44.4	11.612	2	16 37 0.04	2.3355	21 25 14.3	7.589
3	14 53 50.09	2.0643	13 44 19.5	11.557	3	16 39 20.35	2.3416	21 32 46.4	7.477
4	14 55 54.10	2.0693	13 55 51.2	11.500	4	16 41 41.03	2.3477	21 40 11.6	7.361
5	14 57 58.41	2.0744	14 7 19.5	11.443	5	16 44 2.08	2.3538	21 47 29.7	7.243
6	15 0 3.03	2.0795	14 18 44.4	11.385	6	16 46 23.49	2.3599	21 54 40.7	7.124
7	15 2 7.95	2.0846	14 30 5.7	11.326	7	16 48 45.26	2.3658	22 1 44.6	7.004
8	15 4 13.18	2.0897	14 41 23.4	11.264	8	16 51 7.39	2.3719	22 8 41.2	6.882
9	15 6 18.71	2.0949	14 52 37.4	11.203	9	16 53 29.89	2.3779	22 15 30.4	6.759
10	15 8 24.56	2.1001	15 3 47.7	11.140	10	16 55 52.74	2.3838	22 22 12.2	6.635
11	15 10 30.72	2.1053	15 14 54.2	11.075	11	16 58 15.95	2.3898	22 28 46.6	6.510
12	15 12 37.20	2.1107	15 25 56.7	11.009	12	17 0 39.52	2.3957	22 35 13.4	6.383
13	15 14 44.00	2.1161	15 36 55.3	10.943	13	17 3 3.44	2.4016	22 41 32.5	6.255
14	15 16 51.13	2.1215	15 47 49.9	10.875	14	17 5 27.71	2.4074	22 47 44.0	6.127
15	15 18 58.58	2.1269	15 58 40.3	10.806	15	17 7 52.33	2.4132	22 53 47.7	5.996
16	15 21 6.36	2.1324	16 9 26.5	10.735	16	17 10 17.30	2.4190	22 59 43.5	5.864
17	15 23 14.47	2.1379	16 20 8.5	10.665	17	17 12 42.61	2.4247	23 5 31.4	5.731
18	15 25 22.91	2.1435	16 30 46.3	10.593	18	17 15 8.26	2.4303	23 11 11.2	5.596
19	15 27 31.69	2.1492	16 41 19.6	10.518	19	17 17 34.25	2.4359	23 16 42.9	5.461
20	15 29 40.81	2.1548	16 51 48.4	10.443	20	17 20 0.57	2.4415	23 22 6.5	5.326
21	15 31 50.27	2.1605	17 2 12.7	10.366	21	17 22 27.23	2.4471	23 27 21.9	5.187
22	15 34 0.07	2.1663	17 12 32.3	10.288	22	17 24 54.22	2.4526	23 32 29.0	5.049
23	15 36 10.22	2.1720	17 22 47.2	10.209	23	17 27 21.53	2.4582	23 37 27.8	4.909
24	15 38 20.71	2.1778	S. 17° 32' 57.4	10.129	24	17 29 49.16	2.4639	S. 23° 42' 18.1	4.768

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	17 20 49.16	2.4632	S. 23° 42' 18.1"	4.788	0	19 32 32.01	2.6082	S. 24° 31' 11.4"	2.971
1	17 32 17.11	2.4665	23 46 59.9	4.826	1	19 35 8.51	2.6084	24 28 8.0	3.142
2	17 34 45.38	2.4737	23 51 33.2	4.489	2	19 37 45.02	2.6085	24 24 54.4	3.319
3	17 37 13.96	2.4768	23 55 57.8	4.337	3	19 40 21.53	2.6084	24 21 30.6	3.482
4	17 39 42.84	2.4838	24 0 13.7	4.199	4	19 42 58.03	2.6082	24 17 56.5	3.653
5	17 42 12.02	2.4898	24 4 20.8	4.045	5	19 45 34.51	2.6078	24 14 12.2	3.823
6	17 44 41.50	2.4938	24 8 19.1	3.897	6	19 48 10.96	2.6073	24 10 17.7	3.993
7	17 47 11.28	2.4987	24 12 8.5	3.749	7	19 50 47.38	2.6067	24 6 13.0	4.163
8	17 49 41.34	2.5034	24 15 49.0	3.599	8	19 53 23.76	2.6060	24 1 58.1	4.332
9	17 52 11.68	2.5080	24 19 20.4	3.448	9	19 56 0 10	2.6052	23 57 33.1	4.502
10	17 54 42.30	2.5127	24 22 42.7	3.296	10	19 58 36.38	2.6043	23 52 57.9	4.670
11	17 57 13.20	2.5173	24 25 55.9	3.144	11	20 1 12.61	2.6033	23 48 12.7	4.838
12	17 59 44.37	2.5217	24 29 0.0	2.991	12	20 3 48.77	2.6021	23 43 17.4	5.006
13	18 2 15.80	2.5260	24 31 54.8	2.836	13	20 6 24.86	2.6007	23 38 12.0	5.173
14	18 4 47.49	2.5302	24 34 40.3	2.680	14	20 9 0.86	2.5992	23 32 56.6	5.339
15	18 7 19.43	2.5344	24 37 16.4	2.523	15	20 11 36.77	2.5977	23 27 31.3	5.505
16	18 9 51.62	2.5384	24 39 43.1	2.366	16	20 14 12.58	2.5961	23 21 56.0	5.671
17	18 12 24.04	2.5423	24 42 0.3	2.208	17	20 16 48.30	2.5944	23 16 10.8	5.836
18	18 14 56.69	2.5461	24 44 8.1	2.050	18	20 19 23.91	2.5925	23 10 15.7	6.000
19	18 17 29.57	2.5499	24 46 6.3	1.890	19	20 21 59.40	2.5905	23 4 10.8	6.164
20	18 20 2.68	2.5536	24 47 54.9	1.729	20	20 24 34.77	2.5885	22 57 56.1	6.327
21	18 22 36.00	2.5571	24 49 33.8	1.567	21	20 27 10.02	2.5864	22 51 31.6	6.489
22	18 25 9.53	2.5605	24 51 3.0	1.405	22	20 29 45.14	2.5842	22 44 57.4	6.650
23	18 27 43.27	2.5639	S. 24° 52' 22.4"	1.243	23	20 32 20.12	2.5818	S. 22° 38' 13.6"	6.810
MONDAY 22.					WEDNESDAY 24.				
0	18 30 17.20	2.5671	S. 24° 53' 32.1"	1.080	0	20 34 54.95	2.5793	S. 22° 31' 20.2"	6.969
1	18 32 51.32	2.5702	24 54 32.0	0.916	1	20 37 29.63	2.5767	22 24 17.3	7.136
2	18 35 25.63	2.5732	24 55 22.0	0.751	2	20 40 4.15	2.5741	22 17 4.8	7.297
3	18 38 0.11	2.5761	24 56 2.1	0.585	3	20 42 38.52	2.5714	22 9 42.8	7.445
4	18 40 34.76	2.5788	24 56 32.2	0.419	4	20 45 12.72	2.5685	22 2 11.4	7.601
5	18 43 9.57	2.5814	24 56 52.4	0.253	5	20 47 46.74	2.5656	21 54 30.7	7.755
6	18 45 44.53	2.5839	24 57 2.6	- 0.086	6	20 50 20.59	2.5627	21 46 40.8	7.909
7	18 48 19.64	2.5863	24 57 2.8	+ 0.081	7	20 52 54.26	2.5596	21 38 41.7	8.062
8	18 50 54.89	2.5887	24 56 52.9	0.248	8	20 55 27.74	2.5564	21 30 33.4	8.214
9	18 53 30.28	2.5908	24 56 33.0	0.416	9	20 58 1.03	2.5532	21 22 16.0	8.365
10	18 56 5.79	2.5928	24 56 3.0	0.585	10	21 0 34.13	2.5499	21 13 49.6	8.515
11	18 58 41.42	2.5946	24 55 22.8	0.755	11	21 3 7.02	2.5465	21 5 14.2	8.663
12	19 1 17.17	2.5967	24 54 32.4	0.924	12	21 5 39.71	2.5431	20 56 30.0	8.810
13	19 3 53.02	2.5983	24 53 31.9	1.093	13	21 8 12.19	2.5396	20 47 37.0	8.957
14	19 6 28.96	2.5998	24 52 21.2	1.263	14	21 10 44.46	2.5360	20 38 35.2	9.102
15	19 9 4.99	2.6013	24 51 0.3	1.433	15	21 13 16.51	2.5324	20 29 24.7	9.246
16	19 11 41.10	2.6025	24 49 29.2	1.604	16	21 15 48.34	2.5287	20 20 5.7	9.388
17	19 14 17.29	2.6037	24 47 47.8	1.775	17	21 18 19.95	2.5249	20 10 38.2	9.529
18	19 16 53.54	2.6047	24 45 56.2	1.946	18	21 20 51.33	2.5211	20 1 2.2	9.669
19	19 19 29.85	2.6056	24 43 54.3	2.117	19	21 23 22.48	2.5172	19 51 17.9	9.807
20	19 22 6.21	2.6063	24 41 42.2	2.287	20	21 25 53.40	2.5133	19 41 25.3	9.945
21	19 24 42.61	2.6070	24 39 19.9	2.457	21	21 28 24.08	2.5093	19 31 24.5	10.081
22	19 27 19.05	2.6076	24 36 47.3	2.628	22	21 30 54.52	2.5053	19 21 15.6	10.215
23	19 29 55.52	2.6080	24 34 4.5	2.799	23	21 33 24.72	2.5012	19 10 58.7	10.348
24	19 32 32.01	2.6082	S. 24° 31' 11.4"	2.971	24	21 35 54.67	2.4971	S. 19° 0' 33.8"	10.480

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	21 35 54.67	2.4971	S. 19° 0' 33.8"	10.480	0	23 30 49.36	2.9952	S. 8° 37' 1.0"	14.898
1	21 38 24.37	2.4930	18 50 1.1	10.609	1	23 33 6.96	2.9916	8 22 9.9	14.875
2	21 40 53.83	2.4889	18 39 20.7	10.737	2	23 35 24.35	2.9881	8 7 16.0	14.930
3	21 43 23.04	2.4847	18 28 32.6	10.865	3	23 37 41.53	2.9846	7 52 19.5	14.993
4	21 45 51.99	2.4804	18 17 36.9	10.991	4	23 39 58.50	2.9811	7 37 20.5	15.003
5	21 48 20.69	2.4762	18 6 33.7	11.115	5	23 42 15.26	2.9776	7 22 19.1	15.043
6	21 50 49.14	2.4720	17 55 23.1	11.237	6	23 44 31.81	2.9743	7 7 15.4	15.080
7	21 53 17.33	2.4677	17 44 5.2	11.358	7	23 46 48.17	2.9710	6 52 9.5	15.116
8	21 55 45.26	2.4633	17 32 40.1	11.477	8	23 49 4.33	2.9677	6 37 1.5	15.150
9	21 58 12.92	2.4589	17 21 7.9	11.595	9	23 51 20.29	2.9644	6 21 51.5	15.182
10	22 0 40.32	2.4545	17 9 28.7	11.711	10	23 53 36.06	2.9613	6 6 39.7	15.212
11	22 3 7.46	2.4501	16 57 42.6	11.826	11	23 55 51.65	2.9582	5 51 26.1	15.240
12	22 5 34.34	2.4457	16 45 49.6	11.939	12	23 58 7.05	2.9552	5 36 10.9	15.267
13	22 8 0.95	2.4413	16 33 49.9	12.050	13	0 0 22.27	2.9522	5 20 54.1	15.292
14	22 10 27.30	2.4370	16 21 43.6	12.159	14	0 2 37.31	2.9493	5 5 35.9	15.314
15	22 12 53.39	2.4326	16 9 30.8	12.267	15	0 4 52.18	2.9464	4 50 16.4	15.335
16	22 15 19.21	2.4281	15 57 11.6	12.373	16	0 7 6.88	2.9436	4 34 55.7	15.354
17	22 17 44.76	2.4237	15 44 46.0	12.477	17	0 9 21.41	2.9408	4 19 33.9	15.373
18	22 20 10.05	2.4192	15 32 14.3	12.579	18	0 11 35.77	2.9380	4 4 11.0	15.390
19	22 22 35.07	2.4148	15 19 36.5	12.681	19	0 13 49.97	2.9353	3 48 47.2	15.402
20	22 24 59.83	2.4104	15 6 52.6	12.781	20	0 16 4.01	2.9327	3 33 22.7	15.414
21	22 27 24.32	2.4060	14 54 2.8	12.878	21	0 18 17.90	2.9302	3 17 57.5	15.425
22	22 29 48.55	2.4016	14 41 7.2	12.973	22	0 20 31.64	2.9277	3 2 31.7	15.434
23	22 32 12.51	2.3972	S. 14° 28' 6.0"	13.067	23	0 22 45.23	2.9253	S. 2° 47' 5.4"	15.440
FRIDAY 26.					SUNDAY 28.				
0	22 34 36.21	2.3928	S. 14° 14' 59.2"	13.159	0	0 24 58.68	2.9230	S. 2° 31' 38.7"	15.447
1	22 36 59.65	2.3884	14 1 46.9	13.250	1	0 27 11.99	2.9206	2 16 11.7	15.451
2	22 39 22.82	2.3840	13 48 29.2	13.338	2	0 29 25.16	2.9183	2 0 44.6	15.452
3	22 41 45.73	2.3797	13 35 6.3	13.425	3	0 31 38.19	2.9161	1 45 17.4	15.452
4	22 44 8.38	2.3754	13 21 38.2	13.511	4	0 33 51.09	2.9140	1 29 50.3	15.451
5	22 46 30.78	2.3711	13 8 5.0	13.594	5	0 36 3.87	2.9120	1 14 23.3	15.448
6	22 48 52.92	2.3668	12 54 26.9	13.675	6	0 38 16.53	2.9100	0 58 56.5	15.443
7	22 51 14.80	2.3626	12 40 44.0	13.755	7	0 40 20.07	2.9080	0 43 30.1	15.437
8	22 53 36.43	2.3584	12 26 56.3	13.833	8	0 42 41.49	2.9061	0 28 4.1	15.429
9	22 55 57.81	2.3541	12 13 4.0	13.909	9	0 44 53.80	2.9042	S. 0° 12' 38.6"	15.420
10	22 58 18.93	2.3499	11 59 7.2	13.983	10	0 47 6.00	2.9024	N. 0° 2' 46.3"	15.408
11	23 0 39.80	2.3458	11 45 6.0	14.055	11	0 49 18.09	2.9007	0 18 10.4	15.395
12	23 3 0.43	2.3417	11 31 0.6	14.125	12	0 51 30.08	2.8990	0 33 33.7	15.381
13	23 5 20.81	2.3377	11 16 51.0	14.194	13	0 53 41.97	2.8974	0 48 56.1	15.365
14	23 7 40.95	2.3336	11 2 37.3	14.262	14	0 55 53.77	2.8959	1 4 17.5	15.347
15	23 10 0.84	2.3295	10 48 19.6	14.327	15	0 58 5.48	2.8944	1 19 37.7	15.327
16	23 12 20.49	2.3256	10 33 58.1	14.389	16	1 0 17.10	2.8929	1 34 56.7	15.306
17	23 14 39.91	2.3217	10 19 32.9	14.451	17	1 2 28.63	2.8915	1 50 14.4	15.283
18	23 16 59.09	2.3178	10 5 4.0	14.511	18	1 4 40.08	2.8902	2 5 30.7	15.259
19	23 19 18.04	2.3139	9 50 31.6	14.568	19	1 6 51.46	2.8890	2 20 45.5	15.234
20	23 21 36.76	2.3100	9 35 55.8	14.623	20	1 9 2.76	2.8878	2 35 58.7	15.207
21	23 23 55.24	2.3062	9 21 16.8	14.677	21	1 11 13.99	2.8866	2 51 10.3	15.178
22	23 26 13.50	2.3025	9 6 34.6	14.729	22	1 13 25.15	2.8855	3 6 20.1	15.147
23	23 28 31.54	2.2988	8 51 49.3	14.780	23	1 15 36.25	2.8845	3 21 28.0	15.115
24	23 30 49.36	2.2952	S. 8° 37' 1.0"	14.828	24	1 17 47.29	2.8835	N. 3° 36' 33.9"	15.082

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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MONDAY 29.

0	1 17 47.29	2.1835	N. 3 36 33.9	15.082
1	1 19 58.27	2.1836	3 51 37.8	15.047
2	1 22 9.20	2.1817	4 6 39.6	15.011
3	1 24 20.08	2.1809	4 21 39.1	14.979
4	1 26 30.91	2.1801	4 36 36.3	14.933
5	1 28 41.69	2.1793	4 51 31.1	14.893
6	1 30 52.43	2.1787	5 6 23.5	14.852
7	1 33 3.14	2.1782	5 21 13.4	14.808
8	1 35 13.81	2.1776	5 36 0.5	14.762
9	1 37 24.45	2.1771	5 50 44.8	14.715
10	1 39 35.06	2.1767	6 5 26.3	14.668
11	1 41 45.65	2.1762	6 20 5.0	14.620
12	1 43 56.21	2.1758	6 34 40.7	14.569
13	1 46 6.75	2.1756	6 49 13.3	14.517
14	1 48 17.28	2.1754	7 3 42.8	14.464
15	1 50 27.80	2.1752	7 18 9.0	14.409
16	1 52 38.31	2.1751	7 32 31.9	14.353
17	1 54 48.81	2.1749	7 46 51.4	14.296
18	1 56 59.30	2.1748	8 1 7.4	14.237
19	1 59 9.79	2.1749	8 15 19.9	14.178
20	2 1 20.29	2.1750	8 29 28.8	14.117
21	2 3 30.79	2.1751	8 43 33.9	14.054
22	2 5 41.30	2.1752	8 57 35.3	13.991
23	2 7 51.82	2.1753	N. 9 11 32.9	13.927

TUESDAY 30.

0	2 10 2.34	2.1755	N. 9 25 26.5	13.860
1	2 12 12.88	2.1756	9 39 16.1	13.793
2	2 14 23.44	2.1769	9 53 1.7	13.735
3	2 16 34.02	2.1765	10 6 43.1	13.655
4	2 18 44.62	2.1768	10 20 20.3	13.564
5	2 20 55.24	2.1779	10 33 53.2	13.519
6	2 23 5.89	2.1777	10 47 21.7	13.438
7	2 25 16.57	2.1782	11 0 45.8	13.364
8	2 27 27.28	2.1787	11 14 5.4	13.289
9	2 29 38.02	2.1793	11 27 20.5	13.213
10	2 31 48.80	2.1800	11 40 31.0	13.136
11	2 33 59.62	2.1806	11 53 36.8	13.056
12	2 36 10.47	2.1813	12 6 37.7	12.975
13	2 38 21.36	2.1819	12 19 33.8	12.895
14	2 40 32.30	2.1827	12 32 25.1	12.813
15	2 42 43.28	2.1834	12 45 11.4	12.730
16	2 44 54.31	2.1842	12 57 52.7	12.646
17	2 47 5.39	2.1851	13 10 28.9	12.561
18	2 49 16.52	2.1859	13 23 0.0	12.475
19	2 51 27.70	2.1868	13 35 25.9	12.387
20	2 53 38.94	2.1877	13 47 46.5	12.299
21	2 55 50.23	2.1887	14 0 1.8	12.211
22	2 58 1.58	2.1896	14 12 11.8	12.121
23	3 0 12.98	2.1905	14 24 16.3	12.029
24	3 2 24.44	2.1915	N. 14 36 15.3	11.937

WEDNESDAY, OCTOBER 1.

0	3 2 24.44	2.1915	N. 14 36 15.3	11.937
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PHASES OF THE MOON.

	d	h	m
☾ Last Quarter . . . Sept.	5	15	29.4
● New Moon	13	19	53.0
☽ First Quarter	21	10	5.4
○ Full Moon	28	0	59.7

	d	h
☾ Apogee. Sept.	10	11.4
☾ Perigee.	26	3.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W. 75° 53' 44"	2993	77° 24' 5"	2999	78° 54' 19"	3005	80° 24' 25"	3014
	JUPITER	W. 67 42 4	2186	69 30 53	2309	71 19 17	2319	73 7 16	2326
	Fomalhaut	W. 41 6 33	2929	42 44 49	2618	44 23 19	2610	46 2 1	2606
	Aldebaran	E. 56 50 19	2225	55 2 28	2249	53 15 3	2260	51 28 4	2277
	Pollux	E. 100 58 4	2217	99 10 2	2233	97 22 23	2250	95 35 10	2266
2	α Aquilæ	W. 87 51 24	3083	89 19 54	3109	90 48 1	3121	92 15 45	3141
	JUPITER	W. 82 0 47	2394	83 46 11	2343	85 31 7	2362	87 15 37	2381
	Fomalhaut	W. 54 15 57	2617	55 54 29	2694	57 32 52	2633	59 11 2	2649
	α Pegasi	W. 40 28 6	3435	41 49 41	3381	43 12 16	3335	44 35 45	3298
	Aldebaran	E. 42 39 57	2374	40 55 45	2395	39 12 3	2416	37 28 51	2438
3	Pollux	E. 86 45 25	2355	85 0 46	2375	83 16 35	2393	81 32 50	2419
	α Aquilæ	W. 99 27 47	3262	100 52 43	3290	102 17 6	3319	103 40 56	3349
	JUPITER	W. 95 51 21	2475	97 33 10	2493	99 14 32	2519	100 55 28	2531
	Fomalhaut	W. 67 18 13	2704	68 54 48	2718	70 31 4	2739	72 7 1	2747
	α Pegasi	W. 51 42 4	3188	53 8 28	3175	54 35 7	3167	56 1 56	3161
4	Pollux	E. 73 0 49	2507	71 19 45	2505	69 39 7	2545	67 58 56	2564
	SUN	E. 121 36 1	2649	120 2 27	2692	118 29 19	2699	116 56 36	2701
	Fomalhaut	W. 80 1 44	2696	81 35 38	2642	83 9 12	2658	84 42 25	2674
	α Pegasi	W. 63 17 0	3159	64 43 58	3163	66 10 51	3168	67 37 38	3175
	α Arietis	W. 20 26 22	3690	21 41 4	3677	22 58 15	3666	24 17 26	3489
5	Pollux	E. 59 44 29	2657	58 6 51	2675	56 29 38	2693	54 52 49	2710
	SUN	E. 109 19 9	2997	107 48 52	3016	106 18 59	3035	104 49 28	3053
	Fomalhaut	W. 92 23 19	2955	93 54 28	2972	95 25 16	2987	96 55 45	3003
	α Pegasi	W. 74 49 27	3214	76 15 19	3224	77 41 0	3234	79 6 29	3244
	α Arietis	W. 31 12 15	3242	32 37 35	3290	34 3 21	3291	35 29 29	3187
6	Pollux	E. 46 54 31	2797	45 19 59	2813	43 45 49	2829	42 11 59	2845
	SUN	E. 97 27 30	3141	96 0 10	3157	94 33 9	3173	93 6 28	3189
	α Pegasi	W. 86 10 50	3299	87 35 3	3310	88 59 4	3321	90 22 50	3333
	α Arietis	W. 42 43 22	3153	44 10 28	3151	45 37 37	3149	47 4 47	3149
	Pollux	E. 34 27 58	2924	32 56 9	2939	31 24 40	2954	29 53 30	2969
7	SUN	E. 85 57 38	3264	84 32 44	3277	83 8 5	3290	81 43 41	3309
	α Pegasi	W. 97 18 20	3393	98 40 45	3405	100 2 56	3418	101 24 52	3430
	α Arietis	W. 54 20 21	3158	55 47 20	3160	57 14 17	3163	58 41 10	3166
	Aldebaran	W. 22 39 2	3059	24 8 2	3080	25 37 1	3061	27 5 59	3063
	SUN	E. 74 45 14	3359	73 22 11	3369	71 59 19	3379	70 36 39	3388
8	α Arietis	W. 65 54 47	3179	67 21 21	3181	68 47 51	3183	70 14 19	3185
	Aldebaran	W. 34 30 9	3076	35 58 48	3079	37 27 25	3082	38 55 58	3085
	SUN	E. 63 45 43	3498	62 23 58	3434	61 2 20	3440	59 40 49	3446
9	α Arietis	W. 77 26 4	3195	78 52 19	3196	80 18 33	3197	81 44 46	3197
	Aldebaran	W. 46 17 59	3094	47 46 16	3095	49 14 31	3096	50 42 45	3096
	SUN	E. 52 54 46	3470	51 33 48	3474	50 12 55	3477	48 52 6	3480
10	α Arietis	W. 88 55 40	3199	90 21 50	3198	91 48 1	3198	93 14 12	3198
	Aldebaran	W. 58 3 48	3097	59 32 1	3096	61 0 15	3095	62 28 31	3094

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Aquilæ W.	81° 54' 19"	3095	83° 24' 0"	3039	84° 53' 25"	3059	86° 22' 34"	3067
	JUPITER W.	74 54 50	2953	76 41 58	2970	78 28 41	2968	80 14 57	2906
	Fomalhaut W.	47 40 48	2803	49 19 39	2803	50 58 30	2807	52 37 16	2810
	Aldebaran E.	49 41 31	2996	47 55 26	2315	46 9 48	2334	44 24 38	2354
	Pollux E.	93 48 21	2284	92 1 58	2302	90 16 1	2300	88 30 30	2337
2	α Aquilæ W.	93 43 5	3163	95 9 50	3186	96 36 24	3210	98 2 21	3226
	JUPITER W.	88 59 40	2400	90 43 15	2418	92 26 24	2437	94 9 6	2456
	Fomalhaut W.	60 49 0	2654	62 26 42	2666	64 4 10	2678	65 41 20	2690
	α Pegasi W.	45 59 56	3068	47 24 48	3042	48 50 9	3030	50 15 57	3004
	Aldebaran E.	35 46 10	2458	34 3 58	2481	32 22 18	2506	30 41 13	2530
	Pollux E.	79 49 32	2431	78 6 41	2449	76 24 16	2469	74 42 19	2488
3	α Aquilæ W.	105 4 11	3380	106 26 51	3413	107 48 53	3446	109 10 18	3481
	JUPITER W.	102 35 58	2550	104 16 2	2568	105 55 41	2587	107 34 54	2604
	Fomalhaut W.	73 42 38	2763	75 17 55	2777	76 52 51	2793	78 27 28	2809
	α Pegasi W.	57 28 54	3158	58 55 54	3156	60 22 57	3156	61 50 0	3158
	Pollux E.	66 19 12	2583	64 39 53	2601	63 1 0	2630	61 22 32	2638
	SUN E.	115 24 17	2920	113 52 24	2940	112 20 54	2960	110 49 50	2979
4	Fomalhaut W.	86 15 17	2890	87 47 49	2907	89 19 59	2923	90 51 49	2939
	α Pegasi W.	69 4 17	3181	70 30 49	3169	71 57 11	3197	73 23 24	3205
	α Arietis W.	25 38 12	3408	27 0 19	3352	28 23 30	3306	29 47 32	3273
	Pollux E.	53 16 23	2729	51 40 21	2746	50 4 42	2763	48 29 26	2780
	SUN E.	103 20 21	3071	101 51 36	3089	100 23 13	3107	98 55 11	3124
5	Fomalhaut W.	98 25 54	3018	99 55 44	3034	101 25 14	3050	102 54 25	3066
	α Pegasi W.	80 31 46	3254	81 56 51	3265	83 21 43	3276	84 46 23	3287
	α Arietis W.	36 55 54	3175	38 22 33	3166	39 49 23	3161	41 16 19	3155
	Pollux E.	40 38 31	2861	39 5 22	2877	37 32 35	2883	36 0 7	2899
	SUN E.	91 40 6	3205	90 14 3	3230	88 48 18	3235	87 22 49	3250
6	α Pegasi W.	91 46 24	3345	93 9 44	3357	94 32 50	3369	95 55 42	3381
	α Arietis W.	48 31 57	3150	49 59 6	3159	51 26 13	3154	52 53 18	3156
	Pollux E.	28 22 30	2985	26 52 9	3001	25 22 0	3017	23 52 12	3034
	SUN E.	80 19 33	3314	78 55 38	3326	77 31 57	3337	76 8 29	3348
7	α Pegasi W.	102 46 35	3444	104 8 2	3456	105 29 16	3470	106 50 14	3482
	α Arietis W.	60 8 0	3169	61 34 46	3171	63 1 30	3174	64 28 10	3176
	Aldebaran W.	28 34 54	3064	30 3 48	3066	31 32 39	3069	33 1 26	3073
	SUN E.	69 14 9	3397	67 51 49	3405	66 29 38	3413	65 7 36	3421
8	α Arietis W.	71 40 45	3188	73 7 8	3190	74 33 28	3199	75 59 47	3193
	Aldebaran W.	40 24 28	3087	41 52 54	3089	43 21 18	3091	44 49 39	3093
	SUN E.	58 19 25	3452	56 58 7	3457	55 36 55	3469	54 15 48	3486
9	α Arietis W.	83 10 58	3198	84 37 9	3198	86 3 19	3199	87 29 30	3199
	Aldebaran W.	52 10 59	3098	53 39 11	3098	55 7 23	3098	56 35 35	3097
	SUN E.	47 31 19	3483	46 10 36	3486	44 49 56	3488	43 29 19	3490
10	α Arietis W.	94 40 24	3197	96 6 37	3198	97 32 50	3198	98 59 5	3194
	Aldebaran W.	63 56 48	3093	65 25 7	3090	66 53 28	3088	68 21 52	3086

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	SUN E.	42° 8' 44"	3492	40° 48' 11"	3494	39° 27' 40"	3496	38° 7' 15"	3498
11	Aldebaran W.	69 50 18	3083	71 18 48	3081	72 47 21	3078	74 15 57	3075
	SUN E.	31 25 17	3507	30 5 1	3509	28 44 48	3513	27 24 39	3517
15	SUN W.	14 1 28	3522	15 21 28	3489	16 42 12	3445	18 3 38	3400
	Antares E.	63 5 0	2928	61 33 17	2921	60 1 26	2914	58 29 27	2908
	MARS E.	79 24 7	3124	77 56 26	3117	76 28 37	3110	75 0 38	3102
16	SUN W.	24 59 16	3288	26 23 41	3271	27 48 27	3256	29 13 30	3240
	Antares E.	50 47 26	2876	49 14 37	2870	47 41 41	2864	46 8 36	2858
	MARS E.	67 38 26	3062	66 9 30	3054	64 40 25	3046	63 11 9	3038
	α Aquilæ E.	98 18 26	3602	96 59 54	3589	95 41 8	3577	94 22 9	3568
	JUPITER E.	104 24 15	3835	102 50 32	3828	101 16 40	3820	99 42 37	3812
17	SUN W.	36 23 2	3173	37 49 43	3161	39 16 38	3149	40 43 49	3137
	Antares E.	38 21 17	2831	36 47 29	2825	35 13 34	2821	33 39 34	2818
	MARS E.	55 42 16	2995	54 11 57	2986	52 41 27	2977	51 10 45	2968
	α Aquilæ E.	87 44 29	3524	86 24 31	3517	85 4 26	3512	83 44 15	3506
	JUPITER E.	91 49 43	3770	90 14 36	3762	88 39 18	3754	87 3 48	3746
18	SUN W.	48 3 15	3078	49 31 52	3066	51 0 42	3054	52 29 47	3042
	Spica W.	21 44 20	2881	23 17 3	2853	24 50 22	2838	26 24 14	2829
	MARS E.	43 34 24	2991	42 2 32	2911	40 30 28	2901	38 58 11	2891
	α Aquilæ E.	77 2 33	3502	75 42 11	3504	74 21 51	3506	73 1 34	3511
	JUPITER E.	79 3 22	2898	77 26 40	2889	75 49 46	2880	74 12 38	2870
19	SUN W.	59 58 51	2984	61 29 24	2972	63 0 14	2960	64 31 18	2947
	Spica W.	34 21 5	2702	35 57 42	2685	37 34 42	2669	39 12 3	2654
	JUPITER E.	66 3 44	2621	64 25 17	2611	62 46 35	2600	61 7 39	2589
	α Aquilæ E.	66 22 0	3558	65 2 40	3572	63 43 35	3590	62 24 50	3610
	Fomalhaut E.	96 9 36	2803	94 35 12	2791	93 0 33	2780	91 25 39	2769
20	SUN W.	72 10 34	2884	73 43 13	2871	75 16 9	2858	76 49 22	2845
	Spica W.	47 23 53	2581	49 3 14	2567	50 42 54	2553	52 22 52	2539
	VENUS W.	25 59 34	2984	27 30 4	2962	29 1 4	2940	30 32 32	2920
	JUPITER E.	52 49 18	2534	51 8 52	2523	49 28 12	2512	47 47 16	2500
	α Aquilæ E.	55 57 21	3784	54 41 31	3794	53 26 23	3840	52 12 2	3891
	Fomalhaut E.	83 27 33	2718	81 51 14	2706	80 14 41	2695	78 37 55	2686
	α Pegasi E.	101 22 2	2958	99 50 57	2942	98 19 32	2927	96 47 48	2912
21	SUN W.	84 39 38	2780	86 14 32	2767	87 49 45	2754	89 25 14	2740
	Spica W.	60 47 29	2472	62 29 21	2459	64 11 31	2446	65 54 0	2433
	VENUS W.	38 16 8	2826	39 50 2	2809	41 24 17	2793	42 58 54	2776
	JUPITER E.	39 18 38	2445	37 36 8	2434	35 53 22	2423	34 10 20	2412
	Fomalhaut E.	70 30 59	2642	68 53 2	2635	67 14 54	2628	65 36 38	2622
	α Pegasi E.	89 4 40	2848	87 31 15	2837	85 57 34	2826	84 23 40	2817
22	SUN W.	97 27 4	2674	99 4 19	2661	100 41 51	2648	102 19 41	2636
	Spica W.	74 31 2	2368	76 15 22	2356	77 59 59	2344	79 44 55	2332
	VENUS W.	50 57 17	2898	52 33 59	2883	54 11 1	2869	55 48 23	2854
	Antares W.	28 44 33	2422	30 27 37	2403	32 11 9	2384	33 55 8	2368

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
10	SUN	E.	36° 46' 45"	3499	35° 26' 20"	3501	34° 5' 57"	3503	32° 45' 36"	3505
11	Aldebaran	W.	75 44 38	3073	77 13 22	3068	78 42 11	3064	80 11 4	3060
	SUN	E.	26 4 34	3593	24 44 35	3589	23 24 43	3536	22 4 59	3545
15	SUN	W.	19 25 42	3377	20 48 22	3349	22 11 35	3397	23 35 14	3307
	Antares	E.	56 57 19	3003	55 25 3	3005	53 52 39	3008	52 20 7	3002
	MARS	E.	73 32 30	3094	72 4 13	3005	70 35 47	3078	69 7 11	3070
16	SUN	W.	30 38 52	3325	32 4 31	3319	33 30 25	3199	34 56 36	3186
	Antares	E.	44 35 23	3009	43 2 3	3046	41 28 34	3041	39 54 59	3036
	MARS	E.	61 41 44	3030	60 12 8	3092	58 42 21	3013	57 12 24	3004
	α Aquilæ	E.	93 2 58	3555	91 43 35	3546	90 24 2	3538	89 4 20	3530
	JUPITER	E.	98 8 23	3004	96 34 0	3796	94 59 25	3788	93 24 40	3779
17	SUN	W.	42 11 13	3135	43 38 52	3113	45 6 46	3101	46 34 53	3089
	Antares	E.	32 5 29	3015	30 31 22	3019	28 57 10	3011	27 22 57	3019
	MARS	E.	49 39 52	3059	48 8 48	3060	46 37 32	3041	45 6 4	3031
	α Aquilæ	E.	82 24 0	3505	81 3 41	3503	79 43 20	3501	78 22 57	3500
	JUPITER	E.	85 28 6	3735	83 52 13	3736	82 16 8	3717	80 39 51	3708
18	SUN	W.	53 59 7	3031	55 28 41	3030	56 58 29	3008	58 28 33	2996
	Spica	W.	27 58 39	3778	29 33 36	3757	31 9 1	3738	32 44 51	3719
	MARS	E.	37 25 41	3061	35 52 58	3071	34 20 3	3061	32 46 54	3051
	α Aquilæ	E.	71 41 23	3517	70 21 18	3525	69 1 21	3534	67 41 34	3545
	JUPITER	E.	72 35 18	3000	70 57 45	3061	69 19 58	3042	67 41 58	3031
19	SUN	W.	66 2 37	3034	67 34 13	3022	69 6 4	3010	70 38 11	3007
	Spica	W.	40 49 45	3030	42 27 47	3094	44 6 10	3009	45 44 52	2995
	JUPITER	E.	59 28 28	3078	57 49 3	3067	56 9 23	3056	54 29 28	3045
	α Aquilæ	E.	61 6 25	3038	59 48 25	3057	58 30 52	3006	57 13 50	3717
	Fomalhaut	E.	89 50 31	3756	88 15 8	3747	86 39 30	3736	85 3 38	3736
20	SUN	W.	78 22 51	3039	79 56 37	3019	81 30 40	3006	83 5 0	3793
	Spica	W.	54 3 10	3596	55 43 47	3519	57 24 42	3498	59 5 56	3485
	VENUS	W.	32 4 25	3000	33 36 45	3000	35 9 29	3000	36 42 37	3044
	JUPITER	E.	46 6 4	3469	44 24 36	3478	42 42 53	3467	41 0 54	3456
	α Aquilæ	E.	50 58 33	3049	49 46 3	4014	48 34 37	4005	47 24 21	4168
	Fomalhaut	E.	77 0 56	3077	75 23 45	3006	73 46 21	3059	72 8 46	3050
	α Pegasi	E.	95 15 45	3006	94 43 24	3004	92 10 46	3079	90 37 51	3060
21	SUN	W.	91 1 1	3736	92 37 6	3713	94 13 28	3700	95 50 7	3687
	Spica	W.	67 36 47	3480	69 19 53	3407	71 3 18	3394	72 47 1	3381
	VENUS	W.	44 33 53	3700	46 9 13	3744	47 44 54	3739	49 20 55	3713
	JUPITER	E.	32 27 3	3401	30 43 30	3390	28 50 44	3381	27 15 42	3372
	Fomalhaut	E.	63 58 12	3016	62 19 39	3010	60 40 58	3007	59 2 12	3003
	α Pegasi	E.	82 49 33	3006	81 15 15	3000	79 40 45	3792	78 6 6	3785
22	SUN	W.	103 57 48	3094	105 36 11	3011	107 14 52	3306	108 53 49	3286
	Spica	W.	81 30 9	3390	83 15 40	3306	85 1 29	3296	86 47 35	3284
	VENUS	W.	57 26 4	3040	59 4 4	3006	60 42 23	3019	62 21 1	2996
	Antares	W.	35 39 32	3346	37 24 1	3333	39 9 33	3317	40 55 8	3309

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	Fomalhaut E. α Pegasi E.	57 23 21 76 31 17	9601 9779	55 44 26 74 56 21	9600 9773	54 5 33 73 21 18	9600 9769	52 26 36 71 46 10	9601 9767
23	SUN W. Spica W. VENUS W. Antares W. Fomalhaut E. α Pegasi E.	110 33 4 88 33 59 63 59 57 42 41 5 44 13 30 63 50 11	9574 9573 9585 9588 9548 9774	112 12 34 90 20 39 65 39 12 44 27 22 42 35 32 62 15 9	9569 9561 9579 9574 9558 9780	113 52 20 92 7 35 67 18 44 46 13 59 40 57 56 60 40 15	9551 9550 9560 9561 9579 9768	115 32 21 93 54 48 68 58 34 48 0 56 39 20 48 59 5 32	9540 9539 9548 9548 9705 9600
24	SUN W. VENUS W. Antares W. MARS W. α Pegasi F. α Arietis E.	123 56 9 77 21 49 57 0 12 34 52 16 51 16 46 91 22 22	9491 9491 2192 9799 9900 9983	125 37 35 79 3 15 58 48 52 36 36 45 49 44 27 89 35 57	9483 9481 2193 9789 9931 9574	127 19 13 80 44 54 60 37 48 38 21 28 48 12 48 87 49 19	9475 9473 2179 9779 9909 9985	129 1 2 82 26 47 62 26 57 40 6 23 46 41 57 86 2 28	9467 9462 2163 9769 3013 9958
25	VENUS W. Antares W. MARS W. α Arietis E. Aldebaran E.	90 59 13 71 35 55 48 54 1 77 5 47 107 35 18	9494 2195 9799 9931 2190	92 42 14 73 26 16 50 40 3 75 18 6 105 44 49	9418 2190 9793 9937 2114	94 25 23 75 16 45 52 26 14 73 30 18 103 54 11	9419 2115 9716 9934 2109	96 8 40 77 7 22 54 12 32 71 42 26 102 3 25	9407 2110 9711 9923 2104
26	Antares W. MARS W. JUPITER W. α Arietis E. Aldebaran E.	86 21 56 63 5 28 32 50 15 62 42 56 92 48 10	9095 9095 9090 9929 9090	88 13 3 64 52 14 34 41 29 60 55 12 90 56 56	9094 9094 9088 9933 9089	90 4 11 66 39 2 36 32 47 59 7 34 89 5 41	9094 9094 9087 9940 9089	91 55 19 68 25 50 38 24 7 57 20 6 87 14 24	9094 9094 9086 9947 9090
27	Antares W. α Aquilæ W. JUPITER W. α Arietis E. Aldebaran E.	101 10 33 58 42 17 47 40 37 48 26 9 77 58 34	2107 3168 9094 9308 2101	103 1 22 60 9 5 49 31 45 46 40 21 76 7 36	2111 3133 9097 9325 2108	104 52 5 61 36 35 51 22 47 44 54 58 74 16 46	2116 3101 2109 9346 2111	106 42 40 63 4 44 53 13 43 43 10 5 72 26 3	2122 3074 2108 9369 2117
28	α Aquilæ W. JUPITER W. Aldebaran E. Pollux E.	70 32 20 62 26 2 63 15 1 107 22 35	9089 2143 2155 2148	72 2 47 64 15 56 61 25 26 105 32 49	9089 2152 2165 2158	73 33 25 66 5 35 59 36 6 103 43 18	9074 2163 2175 2166	75 4 10 67 55 0 57 47 1 101 53 59	9071 2173 2186 2176
29	α Aquilæ W. JUPITER W. Fomalhaut W. Aldebaran E. Pollux E.	82 38 7 76 57 57 48 36 2 48 46 6 92 51 30	9085 9931 9543 9951 9935	84 8 39 78 45 38 50 16 16 46 58 54 91 3 55	9993 9944 9539 9966 9948	85 39 0 80 32 58 51 56 35 45 12 5 89 16 39	3003 2366 2636 9992 2362	87 9 9 62 19 59 53 36 55 43 25 39 87 29 43	3016 2273 2540 9996 2276
30	α Aquilæ W. JUPITER W. Fomalhaut W. α Pegasi W. Aldebaran E. Pollux E.	94 35 30 91 9 36 61 57 22 46 50 31 34 39 43 78 40 29	3099 2350 2589 3162 2390 2353	96 3 41 92 54 23 63 37 0 48 17 26 32 55 54 76 55 46	3190 2367 2578 3134 2411 2369	97 31 26 94 38 46 65 16 24 49 44 54 31 12 35 75 11 27	3143 2369 2588 3111 2439 2366	98 58 44 96 22 45 66 55 35 51 12 50 29 29 46 73 27 32	3167 2386 2600 3094 2456 2409

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	Fomalhaut E. α Pegasi E.	50° 47' 45" 70 10 59	9804 9765	49° 8' 57" 68 35 45	9810 9765	47° 30' 17" 67 0 31	9818 9766	45° 51' 46" 65 25 19	9826 9769
23	Sun W. Spica W. Venus W. Antares W. Fomalhaut E. α Pegasi E.	117 12 38 95 42 16 70 38 41 49 48 13 37 44 15 57 31 4	9530 9539 9536 9536 9737 9813	118 53 10 97 30 0 72 19 4 51 35 47 36 8 24 55 56 53	9530 9519 9594 9594 9774 9830	120 33 56 99 17 59 73 59 44 53 23 39 34 33 22 54 23 4	9510 9510 9513 9513 9690 9649	122 14 56 101 6 12 75 40 39 55 11 47 32 59 20 52 49 40	9500 9500 9509 9509 9675 9673
24	Sun W. Venus W. Antares W. Mars W. α Pegasi E. α Arietis E.	130 43 2 84 8 53 64 16 21 41 51 32 45 12 0 84 15 27	9460 9453 9155 9760 9098 9851	132 25 11 85 51 12 66 5 57 43 36 53 43 43 4 82 28 15	9453 9445 9147 9752 9119 9945	134 7 30 87 33 41 67 55 45 45 22 25 42 15 18 80 40 53	9448 9438 9139 9743 9187 9399	135 49 56 89 16 22 69 45 45 47 8 8 40 48 53 78 53 23	9443 9431 9139 9736 9385 9235
25	Venus W. Antares W. Mars W. α Arietis E. Aldebaran E.	97 52 4 78 58 6 55 58 58 69 54 29 100 12 33	9403 9106 9707 9229 9100	99 35 34 80 48 56 57 45 29 68 6 34 98 21 34	9400 9109 9703 9229 9097	101 19 9 82 39 51 59 32 5 66 18 39 96 30 30	9397 9098 9700 9223 9094	103 2 48 84 30 53 61 18 45 64 30 46 94 39 22	9395 9096 9697 9225 9092
26	Antares W. Mars W. Jupiter W. α Arietis E. Aldebaran E.	93 46 27 70 12 37 40 15 28 55 32 48 85 23 9	9096 9205 9067 9256 9091	95 37 33 71 59 22 42 6 48 53 45 43 83 31 56	9097 9206 9068 9266 9093	97 28 37 73 46 6 43 58 7 51 58 53 81 40 43	9099 9208 9069 9278 9095	99 19 37 75 32 45 45 49 24 50 12 21 79 49 36	9103 9700 9091 9299 9097
27	Antares W. α Aquilæ W. Jupiter W. α Arietis E. Aldebaran E.	108 33 7 64 33 25 55 4 31 41 25 46 70 35 29	9198 9050 9114 9306 9193	110 23 23 66 2 36 56 55 9 39 42 5 68 45 5	9135 9030 9190 9425 9130	112 13 29 67 32 11 58 45 38 37 59 6 66 54 51	9143 9014 9197 9400 9138	114 3 22 69 2 7 60 35 56 36 16 56 65 4 50	9151 9000 9135 9496 9146
28	α Aquilæ W. Jupiter W. Aldebaran E. Pollux E.	76 34 59 60 44 9 55 58 13 100 4 56	9269 9198 9198 9167	78 5 50 71 33 3 54 9 43 98 16 9	9270 9194 9210 9196	79 36 40 73 21 39 52 21 31 96 27 39	9273 9206 9293 9290	81 7 27 75 9 57 50 33 38 94 39 25	9278 9218 9237 9292
29	α Aquilæ W. Jupiter W. Fomalhaut W. Aldebaran E. Pollux E.	88 39 2 84 6 30 55 17 12 41 39 37 85 43 8	9099 9267 9543 9315 9291	90 8 39 85 52 57 56 57 26 39 53 59 83 56 55	9044 9309 9548 9333 9306	91 37 57 87 38 52 58 37 33 38 8 47 82 11 4	9080 9318 9553 9350 9391	93 6 55 80 24 25 60 17 33 36 24 1 80 25 35	9079 9334 9561 9370 9337
30	α Aquilæ W. Jupiter W. Fomalhaut W. α Pegasi W. Aldebaran E. Pollux E.	100 25 33 98 6 20 68 34 30 52 41 7 27 47 30 71 44 0	9193 9417 9619 9078 9489 9480	101 51 50 99 49 31 70 13 8 54 9 43 26 5 53 70 0 54	9290 9435 9694 9068 9507 9437	103 17 36 101 32 16 71 51 30 55 38 32 24 24 50 68 18 12	9048 9452 9638 9069 9535 9455	104 42 48 103 14 37 73 29 32 57 7 32 22 44 26 66 35 55	9079 9469 9659 9054 9565 9478

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
Wed.	1	^h 12 ^m 30 ^s 16.28	9.056	S. ^o 3 ['] 16 ["] 13.7	-58.22	16' 1.49	64.36	^m 10 ^s 22.79	0.798
Thur.	2	12 33 53.77	9.060	3 39 29.9	58.13	16 1.76	64.41	10 41.79	0.785
Frid.	3	12 37 31.58	9.083	4 2 43.7	58.02	16 2.04	64.46	11 0.47	0.771
Sat.	4	12 41 9.74	9.098	4 25 54.9	-57.90	16 2.31	64.50	11 18.81	0.756
SUN.	5	12 44 48.27	9.114	4 49 2.9	57.76	16 2.59	64.56	11 36.79	0.740
Mon.	6	12 48 27.19	9.131	5 12 7.5	57.60	16 2.86	64.62	11 54.37	0.723
Tues.	7	12 52 6.53	9.148	5 35 8.2	-57.43	16 3.13	64.68	12 11.54	0.706
Wed.	8	12 55 46.30	9.167	5 58 4.8	57.26	16 3.40	64.74	12 28.28	0.687
Thur.	9	12 59 26.52	9.186	6 20 56.9	57.07	16 3.68	64.81	12 44.57	0.668
Frid.	10	13 3 7.20	9.206	6 43 44.0	-56.86	16 3.95	64.88	13 0.39	0.648
Sat.	11	13 6 48.37	9.226	7 6 25.8	56.63	16 4.22	64.95	13 15.74	0.628
SUN.	12	13 10 30.04	9.247	7 29 1.9	56.38	16 4.49	65.02	13 30.58	0.607
Mon.	13	13 14 12.22	9.268	7 51 32.0	-56.12	16 4.77	65.09	13 44.91	0.586
Tues.	14	13 17 54.93	9.290	8 13 55.6	55.84	16 5.04	65.17	13 58.71	0.564
Wed.	15	13 21 38.18	9.313	8 36 12.2	55.54	16 5.32	65.25	14 11.98	0.541
Thur.	16	13 25 21.99	9.337	8 58 21.4	-55.22	16 5.59	65.33	14 24.68	0.517
Frid.	17	13 29 6.38	9.361	9 20 23.0	54.89	16 5.87	65.42	14 36.81	0.493
Sat.	18	13 32 51.35	9.386	9 42 16.4	54.55	16 6.14	65.51	14 48.36	0.468
SUN.	19	13 36 36.93	9.412	10 4 1.3	-54.18	16 6.42	65.60	14 59.31	0.442
Mon.	20	13 40 23.12	9.438	10 25 37.3	53.80	16 6.69	65.70	15 9.64	0.416
Tues.	21	13 44 9.95	9.464	10 47 3.8	53.40	16 6.97	65.80	15 19.35	0.390
Wed.	22	13 47 57.42	9.491	11 8 20.6	-52.99	16 7.24	65.90	15 28.41	0.363
Thur.	23	13 51 45.55	9.520	11 29 27.3	52.56	16 7.52	66.00	15 36.81	0.335
Frid.	24	13 55 34.36	9.549	11 50 23.4	52.11	16 7.79	66.10	15 44.52	0.306
Sat.	25	13 59 23.87	9.578	12 11 8.6	-51.65	16 8.06	66.21	15 51.55	0.277
SUN.	26	14 3 14.10	9.608	12 31 42.5	51.17	16 8.32	66.31	15 57.87	0.247
Mon.	27	14 7 5.06	9.639	12 52 4.8	50.67	16 8.58	66.42	16 3.45	0.216
Tues.	28	14 10 56.76	9.670	13 12 15.0	-50.16	16 8.84	66.53	16 8.28	0.185
Wed.	29	14 14 49.21	9.702	13 32 12.8	49.63	16 9.10	66.64	16 12.37	0.153
Thur.	30	14 18 42.44	9.735	13 51 57.7	49.09	16 9.35	66.75	16 15.69	0.120
Frid.	31	14 22 36.47	9.768	14 11 29.4	48.53	16 9.59	66.86	16 18.22	0.087
Sat.	32	14 26 31.31	9.802	S. 14 30 47.5	-47.96	16 9.83	66.97	16 19.94	0.053

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sideral time.

The sign prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.								
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Wed.	1	^h 12 ^m 30 ^s 17.85	9.058	S. ^o 3 ['] 16 ["] 23.8	-58.23	^m 10 ^s 22.91	0.798	^h 12 ^m 40 ^s 40.76
Thur.	2	12 33 55.39	9.071	3 39 40.3	58.14	10 41.92	0.785	12 44 37.31
Frid.	3	12 37 33.25	9.065	4 2 54.4	58.03	11 0.61	0.771	12 48 33.86
Sat.	4	12 41 11.46	9.100	4 26 5.8	-57.91	11 18.95	0.756	12 52 30.41
SUN.	5	12 44 50.04	9.116	4 49 14.1	57.77	11 36.93	0.740	12 56 26.97
Mon.	6	12 48 29.01	9.133	5 12 18.9	57.61	11 54.51	0.723	13 0 23.52
Tues.	7	12 52 8.39	9.150	5 35 19.9	-57.44	12 11.68	0.706	13 4 20.08
Wed.	8	12 55 48.21	9.169	5 58 16.7	57.27	12 28.42	0.687	13 8 16.63
Thur.	9	12 59 28.47	9.188	6 21 9.0	57.08	12 44.71	0.668	13 12 13.18
Frid.	10	13 3 9.20	9.208	6 43 56.3	-56.87	13 0.53	0.648	13 16 9.73
Sat.	11	13 6 50.41	9.228	7 6 38.3	56.64	13 15.88	0.628	13 20 6.29
SUN.	12	13 10 32.12	9.249	7 29 14.6	56.39	13 30.72	0.607	13 24 2.84
Mon.	13	13 14 14.35	9.270	7 51 44.8	-56.13	13 45.05	0.586	13 27 59.40
Tues.	14	13 17 57.10	9.292	8 14 8.5	55.85	13 58.85	0.564	13 31 55.95
Wed.	15	13 21 40.39	9.315	8 36 25.3	55.55	14 12.11	0.541	13 35 52.50
Thur.	16	13 25 24.24	9.330	8 58 34.7	-55.23	14 24.81	0.517	13 39 49.05
Frid.	17	13 29 8.67	9.363	9 20 36.4	54.90	14 36.94	0.493	13 43 45.61
Sat.	18	13 32 53.68	9.388	9 42 29.9	54.55	14 48.18	0.468	13 47 42.16
SUN.	19	13 36 39.29	9.414	10 4 11.9	-54.18	14 59.42	0.442	13 51 38.72
Mon.	20	13 40 25.52	9.440	10 25 50.9	53.80	15 9.75	0.416	13 55 35.27
Tues.	21	13 44 12.38	9.466	10 47 17.5	53.40	15 19.45	0.390	13 59 31.83
Wed.	22	13 47 59.88	9.493	11 8 34.3	-52.99	15 28.50	0.363	14 3 28.38
Thur.	23	13 51 48.04	9.521	11 29 41.0	52.56	15 36.89	0.335	14 7 24.93
Frid.	24	13 55 36.88	9.550	11 50 37.1	52.11	15 44.60	0.306	14 11 21.48
Sat.	25	13 59 26.42	9.579	12 11 22.3	-51.65	15 51.62	0.277	14 15 18.04
SUN.	26	14 3 16.67	9.609	12 31 56.2	51.17	15 57.93	0.247	14 19 14.60
Mon.	27	14 7 7.65	9.640	12 52 18.4	50.67	16 3.50	0.216	14 23 11.15
Tues.	28	14 10 59.37	9.671	13 12 28.5	-50.16	16 8.33	0.185	14 27 7.70
Wed.	29	14 14 51.84	9.703	13 32 26.2	49.63	16 12.41	0.153	14 31 4.26
Thur.	30	14 18 45.09	9.736	13 52 11.0	49.09	16 15.72	0.120	14 35 0.81
Frid.	31	14 22 39.13	9.769	14 11 42.6	48.53	16 18.24	0.087	14 38 57.37
Sat.	32	14 26 33.98	9.803	S. 14 31 0.6	-47.96	16 19.95	0.053	14 42 53.92
NOTE. —The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.								Diff. for 1 hour. + 9".8565 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	274	188° 15' 11.8	14' 51.3	147.81	— 0.50	0.0002264	—51.4	11 ^h 17 ^m 27.96 ^s
2	275	189 14 15.6	13 55.0	147.70	0.39	0.0001033	51.3	11 13 32.05
3	276	190 13 21.7	13 1.0	147.79	0.27	9.9999805	51.1	11 9 36.14
4	277	191 12 30.0	12 9.2	147.89	— 0.14	9.9998580	—51.0	11 5 40.23
5	278	192 11 40.6	11 19.7	147.99	0.00	9.9997357	50.9	11 1 44.33
6	279	193 10 53.6	10 32.6	148.09	+ 0.11	9.9996135	50.9	10 57 48.42
7	280	194 10 9.0	9 47.9	148.19	+ 0.21	9.9994913	—50.9	10 53 52.51
8	281	195 9 26.7	9 5.5	148.29	0.29	9.9993690	51.0	10 49 56.60
9	282	196 8 46.7	8 25.4	148.38	0.35	9.9992466	51.1	10 46 0.69
10	283	197 8 8.9	7 47.5	148.47	+ 0.38	9.9991239	—51.2	10 42 4.79
11	284	198 7 33.3	7 11.8	148.56	0.38	9.9990009	51.3	10 38 8.88
12	285	199 7 0.0	6 38.4	148.65	0.34	9.9988775	51.4	10 34 12.97
13	286	200 6 28.8	6 7.1	148.73	+ 0.28	9.9987540	—51.5	10 30 17.06
14	287	201 5 59.6	5 37.8	148.82	0.19	9.9986301	51.6	10 26 21.16
15	288	202 5 32.4	5 10.5	148.90	+ 0.08	9.9985059	51.8	10 22 25.25
16	289	203 5 7.1	4 45.1	148.98	— 0.04	9.9983815	—51.9	10 18 29.34
17	290	204 4 43.7	4 21.5	149.06	0.17	9.9982570	51.9	10 14 33.43
18	291	205 4 22.1	3 59.8	149.14	0.30	9.9981326	51.8	10 10 37.53
19	292	206 4 2.3	3 39.9	149.21	— 0.43	9.9980084	—51.7	10 6 41.62
20	293	207 3 44.2	3 21.7	149.28	0.55	9.9978845	51.5	10 2 45.71
21	294	208 3 27.9	3 5.3	149.35	0.65	9.9977610	51.3	9 58 49.80
22	295	209 3 13.3	2 50.5	149.43	— 0.72	9.9976382	—51.0	9 54 53.90
23	296	210 3 0.4	2 37.5	149.50	0.77	9.9975163	50.6	9 50 57.99
24	297	211 2 49.1	2 26.1	149.57	0.79	9.9973954	50.2	9 47 2.08
25	298	212 2 39.5	2 16.4	149.64	— 0.77	9.9972756	—49.7	9 43 6.17
26	299	213 2 31.7	2 8.5	149.72	0.73	9.9971570	49.2	9 39 10.26
27	300	214 2 25.7	2 2.3	149.79	0.66	9.9970396	48.6	9 35 14.35
28	301	215 2 21.5	1 58.0	149.87	— 0.57	9.9969237	—48.0	9 31 18.44
29	302	216 2 19.2	1 55.6	149.94	0.46	9.9968093	47.4	9 27 22.53
30	303	217 2 18.9	1 55.2	150.02	0.33	9.9966964	46.8	9 23 26.63
31	304	218 2 20.7	1 56.9	150.11	0.20	9.9965850	46.1	9 19 30.72
32	305	219 2 24.5	2 0.6	150.20	— 0.06	9.9964750	—45.5	9 15 34.81
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .								Diff. for 1 Hour, — 9 ^h .5896. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15' 49.5	15' 42.2	57' 57.8	-2.90	57' 31.3	-2.21	h m 14 52.0	m 2.12	d 17.2
2	15 35.0	15 28.0	57 4.9	2.17	56 39.3	2.09	15 43.2	2.14	18.2
3	15 21.4	15 15.1	56 14.8	1.98	55 51.9	1.84	16 34.9	2.16	19.2
4	15 9.4	15 4.2	55 30.8	-1.67	55 11.8	-1.49	17 26.8	2.14	20.2
5	14 59.7	14 55.8	54 55.2	1.29	54 41.0	1.09	18 17.8	2.10	21.2
6	14 52.6	14 50.2	54 29.3	0.87	54 20.2	0.65	19 7.5	2.03	22.2
7	14 48.4	14 47.3	54 13.7	-0.44	54 9.7	-0.24	19 55.5	1.95	23.2
8	14 46.9	14 47.1	54 8.1	-0.04	54 8.9	+0.16	20 41.1	1.87	24.2
9	14 47.9	14 49.3	54 11.9	+0.34	54 16.9	0.50	21 25.1	1.80	25.2
10	14 51.1	14 53.5	54 23.8	+0.65	54 32.4	+0.78	22 7.7	1.77	26.2
11	14 56.2	14 59.3	54 42.5	0.90	54 53.9	1.00	22 50.0	1.76	27.2
12	15 2.7	15 6.4	55 6.4	1.09	55 19.8	1.15	23 32.3	1.79	28.2
13	15 10.2	15 14.2	55 33.8	+1.19	55 48.3	+1.22	6		29.2
14	15 18.2	15 22.2	56 3.1	1.24	56 18.0	1.25	0 15.8	1.87	0.5
15	15 26.3	15 30.4	56 33.0	1.25	56 47.9	1.24	1 1.4	1.96	1.5
16	15 34.4	15 38.4	57 2.7	+1.22	57 17.2	+1.20	1 49.8	2.09	2.5
17	15 42.2	15 46.0	57 31.4	1.17	57 45.3	1.15	2 41.7	2.24	3.5
18	15 49.7	15 53.3	57 58.9	1.12	58 12.1	1.09	3 37.2	2.37	4.5
19	15 56.8	16 0.1	58 24.9	+1.05	58 37.2	+1.01	4 35.5	2.46	5.5
20	16 3.4	16 6.4	58 49.0	0.96	59 0.1	0.90	5 35.3	2.48	6.5
21	16 9.2	16 11.7	59 10.4	0.82	59 19.7	0.73	6 34.8	2.43	7.5
22	16 13.9	16 15.7	59 27.8	+0.62	59 34.5	+0.49	7 32.1	2.33	8.5
23	16 17.1	16 17.9	59 39.4	+0.34	59 42.4	+0.16	8 26.9	2.23	9.5
24	16 18.1	16 17.7	59 43.2	-0.04	59 41.6	-0.24	9 19.2	2.14	10.5
25	16 16.6	16 14.7	59 37.5	-0.46	59 30.7	-0.68	10 9.7	2.08	11.5
26	16 12.2	16 8.9	59 21.3	0.90	59 9.2	1.11	10 59.2	2.06	12.5
27	16 4.9	16 0.3	58 54.7	1.31	58 37.9	1.48	11 48.7	2.08	13.5
28	15 55.2	15 49.7	58 19.2	-1.63	57 59.0	-1.74	12 39.0	2.12	14.5
29	15 43.9	15 37.9	57 37.6	1.82	57 15.5	1.86	13 30.4	2.17	15.5
30	15 31.8	15 25.8	56 53.1	1.86	56 30.9	1.83	14 23.0	2.20	16.5
31	15 19.9	15 14.3	56 9.3	1.77	55 48.7	1.67	15 15.9	2.20	17.5
32	15 9.0	15 4.2	55 29.4	-1.54	55 11.8	-1.39	16 8.4	2.16	18.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
0	3 2 24.44	2.1915	N.14° 36' 15.3"	11.937	0	4 48 54.35	2.9438	N.22° 8' 16.1"	6.651
1	3 4 35.96	2.1926	14 48 8.7	11.844	1	4 51 9.00	2.9445	22 14 51.5	6.598
2	3 6 47.55	2.1937	14 59 56.6	11.761	2	4 53 23.69	2.9452	22 21 19.5	6.404
3	3 8 59.20	2.1947	15 11 38.8	11.686	3	4 55 38.43	2.9459	22 27 40.0	6.280
4	3 11 10.91	2.1957	15 23 15.3	11.600	4	4 57 53.20	2.9465	22 33 53.1	6.157
5	3 13 22.69	2.1968	15 34 46.0	11.463	5	5 0 8.01	2.9472	22 39 58.8	6.033
6	3 15 34.53	2.1979	15 46 10.9	11.366	6	5 2 22.86	2.9478	22 45 57.0	5.906
7	3 17 46.44	2.1991	15 57 29.9	11.268	7	5 4 37.74	2.9483	22 51 47.7	5.783
8	3 19 58.42	2.2002	16 8 43.0	11.169	8	5 6 52.65	2.9487	22 57 30.9	5.657
9	3 22 10.46	2.2013	16 19 50.2	11.069	9	5 9 7.58	2.9491	23 3 6.5	5.531
10	3 24 22.57	2.2024	16 30 51.3	10.968	10	5 11 22.54	2.9495	23 8 34.6	5.406
11	3 26 34.75	2.2036	16 41 46.3	10.867	11	5 13 37.52	2.9499	23 13 55.2	5.280
12	3 28 47.01	2.2049	16 52 35.3	10.765	12	5 15 52.53	2.9503	23 19 8.2	5.153
13	3 30 59.34	2.2060	17 3 18.1	10.661	13	5 18 7.56	2.9508	23 24 13.6	5.027
14	3 33 11.73	2.2072	17 13 54.6	10.557	14	5 20 22.60	2.9508	23 29 11.4	4.901
15	3 35 24.20	2.2084	17 24 24.9	10.453	15	5 22 37.65	2.9510	23 34 1.7	4.775
16	3 37 36.74	2.2096	17 34 48.9	10.347	16	5 24 52.72	2.9519	23 38 44.4	4.647
17	3 39 49.35	2.2108	17 45 6.5	10.241	17	5 27 7.80	2.9513	23 43 19.4	4.519
18	3 42 2.04	2.2121	17 55 17.8	10.134	18	5 29 22.88	2.9514	23 47 46.7	4.392
19	3 44 14.80	2.2133	18 5 22.6	10.026	19	5 31 37.97	2.9516	23 52 6.4	4.265
20	3 46 27.63	2.2144	18 15 20.9	9.917	20	5 33 53.06	2.9514	23 56 18.5	4.138
21	3 48 40.53	2.2156	18 25 12.7	9.809	21	5 36 8.14	2.9513	24 0 23.0	4.011
22	3 50 53.50	2.2168	18 34 58.0	9.700	22	5 38 23.22	2.9512	24 4 19.8	3.884
23	3 53 6.55	2.2181	N.18 44 36.7	9.590	23	5 40 38.29	2.9511	N.24 8 9.0	3.757
THURSDAY 2.					SATURDAY 4.				
0	3 55 19.67	2.2193	N.18 54 8.8	9.479	0	5 42 53.35	2.9509	N.24 11 50.6	3.630
1	3 57 32.86	2.2204	19 3 34.2	9.367	1	5 45 8.40	2.9507	24 15 24.5	3.501
2	3 59 46.12	2.2216	19 12 52.8	9.254	2	5 47 23.43	2.9504	24 18 50.7	3.373
3	4 1 59.45	2.2227	19 22 4.7	9.141	3	5 49 38.44	2.9500	24 22 9.2	3.245
4	4 4 12.85	2.2239	19 31 9.8	9.027	4	5 51 53.43	2.9497	24 25 20.1	3.117
5	4 6 26.32	2.2251	19 40 8.0	8.913	5	5 54 8.40	2.9493	24 28 23.3	2.989
6	4 8 39.87	2.2263	19 48 59.4	8.799	6	5 56 23.34	2.9488	24 31 18.8	2.862
7	4 10 53.48	2.2274	19 57 43.9	8.684	7	5 58 38.25	2.9489	24 34 6.7	2.734
8	4 13 7.16	2.2285	20 6 21.5	8.568	8	6 0 53.12	2.9476	24 36 46.9	2.607
9	4 15 20.90	2.2296	20 14 52.1	8.452	9	6 3 7.96	2.9470	24 39 19.5	2.479
10	4 17 34.71	2.2307	20 23 15.7	8.335	10	6 5 22.76	2.9463	24 41 44.4	2.352
11	4 19 48.59	2.2318	20 31 32.3	8.218	11	6 7 37.52	2.9456	24 44 1.7	2.224
12	4 22 2.53	2.2328	20 39 41.9	8.101	12	6 9 52.23	2.9448	24 46 11.3	2.097
13	4 24 16.53	2.2338	20 47 44.4	7.982	13	6 12 6.89	2.9439	24 48 13.3	1.969
14	4 26 30.59	2.2349	20 55 39.7	7.863	14	6 14 21.50	2.9431	24 50 7.6	1.842
15	4 28 44.72	2.2360	21 3 27.9	7.743	15	6 16 36.06	2.9422	24 51 54.3	1.715
16	4 30 58.91	2.2369	21 11 8.9	7.623	16	6 18 50.56	2.9411	24 53 33.4	1.588
17	4 33 13.15	2.2378	21 18 42.7	7.504	17	6 21 4.99	2.9400	24 55 4.9	1.462
18	4 35 27.45	2.2387	21 26 9.4	7.384	18	6 23 19.36	2.9389	24 56 28.8	1.336
19	4 37 41.80	2.2397	21 33 28.8	7.263	19	6 25 33.66	2.9378	24 57 45.1	1.208
20	4 39 56.21	2.2406	21 40 40.9	7.141	20	6 27 47.89	2.9366	24 58 53.8	1.082
21	4 42 10.67	2.2414	21 47 45.7	7.019	21	6 30 2.05	2.9353	24 59 54.0	0.956
22	4 44 25.18	2.2423	21 54 43.2	6.897	22	6 32 16.13	2.9341	25 0 48.5	0.830
23	4 46 39.74	2.2431	22 1 33.3	6.774	23	6 34 30.14	2.9329	25 1 34.5	0.704
24	4 48 54.35	2.2438	N.22 8 16.1	6.651	24	6 36 44.07	2.9314	N.25 2 13.0	0.579

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 5.					TUESDAY 7.				
0	6 36 44.07	2.2914	N.25° 2' 13.0"	0.579	0	8 21 23.95	2.1159	N.23° 11' 42.8"	5.019
1	6 38 57.91	2.2920	25 2 44.0	0.454	1	8 23 30.81	2.1127	23 6 38.5	5.123
2	6 41 11.66	2.2924	25 3 7.5	0.308	2	8 25 37.48	2.1096	23 1 28.0	5.227
3	6 43 25.32	2.2928	25 3 23.4	0.903	3	8 27 43.96	2.1065	22 56 11.2	5.331
4	6 45 38.88	2.2932	25 3 31.9	+ 0.679	4	8 29 50.26	2.1034	22 50 48.2	5.435
5	6 47 52.35	2.2936	25 3 32.9	- 0.646	5	8 31 56.37	2.1003	22 45 19.0	5.537
6	6 50 5.72	2.2939	25 3 26.4	0.170	6	8 34 2.29	2.0971	22 39 43.7	5.639
7	6 52 18.99	2.2938	25 3 12.5	0.923	7	8 36 8.02	2.0938	22 34 2.3	5.741
8	6 54 32.15	2.2184	25 2 51.2	0.416	8	8 38 13.55	2.0906	22 28 14.8	5.843
9	6 56 45.20	2.2166	25 2 22.6	0.539	9	8 40 18.89	2.0874	22 22 21.3	5.945
10	6 58 58.14	2.2147	25 1 46.6	0.688	10	8 42 24.04	2.0843	22 16 21.8	6.041
11	7 1 10.97	2.2129	25 1 3.2	0.785	11	8 44 29.00	2.0811	22 10 16.4	6.140
12	7 3 23.69	2.2110	25 0 12.4	0.907	12	8 46 33.77	2.0778	22 4 5.0	6.239
13	7 5 36.29	2.2089	24 59 14.3	1.089	13	8 48 38.34	2.0746	21 57 47.7	6.337
14	7 7 48.76	2.2068	24 58 8.9	1.150	14	8 50 42.72	2.0714	21 51 24.6	6.434
15	7 10 1.10	2.2047	24 56 56.3	1.371	15	8 52 46.91	2.0682	21 44 55.7	6.530
16	7 12 13.32	2.2026	24 55 36.4	1.399	16	8 54 50.90	2.0649	21 38 21.0	6.626
17	7 14 25.41	2.2004	24 54 9.3	1.512	17	8 56 54.70	2.0617	21 31 40.6	6.721
18	7 16 37.37	2.1983	24 52 35.0	1.638	18	8 58 58.30	2.0584	21 24 54.5	6.816
19	7 18 49.19	2.1960	24 50 53.5	1.758	19	9 1 1.71	2.0552	21 18 2.7	6.910
20	7 21 0.88	2.1938	24 49 4.8	1.871	20	9 3 4.93	2.0520	21 11 5.3	7.003
21	7 23 12.43	2.1919	24 47 9.0	1.990	21	9 5 7.95	2.0488	21 4 2.3	7.096
22	7 25 23.83	2.1898	24 45 6.0	2.108	22	9 7 10.78	2.0456	20 56 53.8	7.188
23	7 27 35.09	2.1885	N.24 42 56.0	2.226	23	9 9 13.42	2.0423	N.20 49 39.8	7.280
MONDAY 6.					WEDNESDAY 8.				
0	7 29 46.21	2.1861	N.24 40 38.9	2.343	0	9 11 15.86	2.0391	N.20 42 20.2	7.372
1	7 31 57.18	2.1815	24 38 14.8	2.460	1	9 13 18.11	2.0359	20 34 55.2	7.462
2	7 34 7.90	2.1789	24 35 43.7	2.577	2	9 15 20.17	2.0327	20 27 24.8	7.551
3	7 36 18.65	2.1763	24 33 5.5	2.694	3	9 17 22.04	2.0296	20 19 49.1	7.639
4	7 38 29.15	2.1737	24 30 20.4	2.809	4	9 19 23.72	2.0265	20 12 8.1	7.728
5	7 40 39.50	2.1711	24 27 28.4	2.924	5	9 21 25.22	2.0234	20 4 21.8	7.816
6	7 42 49.69	2.1685	24 24 29.5	3.039	6	9 23 26.53	2.0202	19 56 30.2	7.903
7	7 44 59.73	2.1658	24 21 23.7	3.153	7	9 25 27.65	2.0171	19 48 33.4	7.989
8	7 47 0.58	2.1630	24 18 11.1	3.267	8	9 27 28.58	2.0139	19 40 31.5	8.075
9	7 49 19.28	2.1602	24 14 51.6	3.381	9	9 29 29.32	2.0108	19 32 24.4	8.161
10	7 51 28.81	2.1575	24 11 25.4	3.494	10	9 31 29.88	2.0077	19 24 12.2	8.245
11	7 53 38.18	2.1547	24 7 52.4	3.606	11	9 33 30.25	2.0047	19 15 55.0	8.329
12	7 55 47.38	2.1518	24 4 12.7	3.718	12	9 35 30.44	2.0017	19 7 32.8	8.412
13	7 57 56.40	2.1489	24 0 26.3	3.829	13	9 37 30.45	1.9987	18 59 5.6	8.494
14	8 0 5.25	2.1461	23 56 33.2	3.940	14	9 39 30.28	1.9956	18 50 33.5	8.576
15	8 2 13.93	2.1432	23 52 33.5	4.050	15	9 41 29.92	1.9925	18 41 56.5	8.658
16	8 4 22.43	2.1402	23 48 27.2	4.160	16	9 43 29.38	1.9896	18 33 14.6	8.739
17	8 6 30.75	2.1373	23 44 14.3	4.269	17	9 45 28.67	1.9867	18 24 27.8	8.820
18	8 8 38.90	2.1343	23 39 54.9	4.377	18	9 47 27.78	1.9837	18 15 36.2	8.899
19	8 10 46.87	2.1312	23 35 29.0	4.486	19	9 49 26.72	1.9808	18 6 39.9	8.977
20	8 12 54.65	2.1282	23 30 56.6	4.594	20	9 51 25.48	1.9779	17 57 39.0	9.054
21	8 15 2.25	2.1252	23 26 17.7	4.701	21	9 53 24.07	1.9751	17 48 33.4	9.131
22	8 17 9.67	2.1221	23 21 32.3	4.807	22	9 55 22.49	1.9723	17 39 23.2	9.208
23	8 19 16.90	2.1190	23 16 40.8	4.913	23	9 57 20.74	1.9695	17 30 8.4	9.285
24	8 21 23.95	2.1159	N.23 11 42.8	5.019	24	9 59 18.83	1.9667	N.17 20 49.0	9.361

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 9.					SATURDAY 11.				
0	9 ^h 59 ^m 18.83	1.9087	N. 17° 20' 49.0	9.361	0	11 ^h 31 ^m 8.74	1.8751	N. 8° 37' 27.6	12.182
1	10 1 16.75	1.9039	17 11 25.1	9.425	1	11 33 1.22	1.8742	8 25 15.4	12.223
2	10 3 14.50	1.9019	17 1 56.8	9.508	2	11 34 53.65	1.8734	8 13 0.8	12.264
3	10 5 12.09	1.9085	16 52 24.1	9.589	3	11 36 46.03	1.8727	8 0 43.7	12.305
4	10 7 9.52	1.9058	16 42 47.0	9.655	4	11 38 38.37	1.8720	7 48 24.2	12.344
5	10 9 6.79	1.9039	16 33 5.5	9.797	5	11 40 30.67	1.8714	7 36 2.4	12.383
6	10 11 3.90	1.9006	16 23 19.7	9.798	6	11 42 22.94	1.8708	7 23 38.3	12.421
7	10 13 0.86	1.9480	16 13 29.7	9.869	7	11 44 15.17	1.8702	7 11 11.9	12.458
8	10 14 57.66	1.9454	16 3 35.4	9.940	8	11 46 7.37	1.8696	6 58 43.3	12.496
9	10 16 54.31	1.9439	15 53 36.9	10.009	9	11 47 59.55	1.8694	6 46 12.5	12.531
10	10 18 50.81	1.9404	15 43 34.3	10.078	10	11 49 51.70	1.8690	6 33 39.6	12.566
11	10 20 47.16	1.9379	15 33 27.6	10.146	11	11 51 43.83	1.8687	6 21 4.7	12.598
12	10 22 43.36	1.9355	15 23 16.8	10.213	12	11 53 35.94	1.8684	6 8 27.8	12.632
13	10 24 39.42	1.9332	15 13 2.0	10.280	13	11 55 28.04	1.8682	5 55 48.9	12.665
14	10 26 35.34	1.9308	15 2 43.2	10.346	14	11 57 20.13	1.8681	5 43 8.0	12.697
15	10 28 31.12	1.9285	14 52 20.5	10.411	15	11 59 12.21	1.8679	5 30 25.2	12.729
16	10 30 26.76	1.9262	14 41 53.9	10.476	16	12 1 4.28	1.8678	5 17 40.5	12.759
17	10 32 22.26	1.9239	14 31 23.4	10.540	17	12 2 56.35	1.8679	5 4 54.1	12.788
18	10 34 17.63	1.9217	14 20 49.1	10.603	18	12 4 48.43	1.8680	4 52 5.9	12.817
19	10 36 12.87	1.9196	14 10 11.0	10.666	19	12 6 40.51	1.8681	4 39 16.0	12.846
20	10 38 7.98	1.9174	13 59 29.2	10.728	20	12 8 32.60	1.8682	4 26 24.4	12.873
21	10 40 2.96	1.9153	13 48 43.7	10.789	21	12 10 24.70	1.8684	4 13 31.2	12.900
22	10 41 57.82	1.9133	13 37 54.5	10.850	22	12 12 16.81	1.8687	4 0 36.4	12.925
23	10 43 52.56	1.9113	N. 13° 27' 1.7	10.910	23	12 14 8.94	1.8691	N. 3° 47' 40.2	12.949
FRIDAY 10.					SUNDAY 12.				
0	10 45 47.17	1.9093	N. 13° 16' 5.3	10.969	0	12 16 1.10	1.8695	N. 3° 34' 42.5	12.973
1	10 47 41.67	1.9074	13 5 5.4	11.027	1	12 17 53.28	1.8699	3 21 43.4	12.997
2	10 49 36.06	1.9056	12 54 2.0	11.085	2	12 19 45.49	1.8704	3 8 42.9	13.020
3	10 51 30.33	1.9036	12 42 55.2	11.143	3	12 21 37.73	1.8709	2 55 41.0	13.042
4	10 53 24.49	1.9018	12 31 44.9	11.199	4	12 23 30.00	1.8715	2 42 37.8	13.063
5	10 55 18.54	1.9000	12 20 31.3	11.255	5	12 25 22.31	1.8722	2 29 33.4	13.083
6	10 57 12.49	1.8983	12 9 14.3	11.311	6	12 27 14.67	1.8730	2 16 27.9	13.102
7	10 59 6.33	1.8966	11 57 54.0	11.365	7	12 29 7.07	1.8738	2 3 21.2	13.121
8	11 1 0.08	1.8950	11 46 30.5	11.419	8	12 30 59.52	1.8746	1 50 13.4	13.138
9	11 2 53.73	1.8934	11 35 3.8	11.473	9	12 32 52.02	1.8755	1 37 4.6	13.154
10	11 4 47.29	1.8919	11 23 33.9	11.524	10	12 34 44.58	1.8765	1 23 54.9	13.169
11	11 6 40.76	1.8903	11 12 0.9	11.575	11	12 36 37.20	1.8774	1 10 44.3	13.184
12	11 8 34.13	1.8888	11 0 24.9	11.625	12	12 38 29.87	1.8784	0 57 32.8	13.198
13	11 10 27.42	1.8875	10 48 45.9	11.676	13	12 40 22.61	1.8796	0 44 20.5	13.212
14	11 12 20.63	1.8862	10 37 3.8	11.727	14	12 42 15.42	1.8808	0 31 7.4	13.225
15	11 14 13.76	1.8848	10 25 18.7	11.778	15	12 44 8.31	1.8821	0 17 53.5	13.237
16	11 16 6.81	1.8835	10 13 30.7	11.823	16	12 46 1.27	1.8834	N. 0° 4 38.9	13.248
17	11 17 59.78	1.8822	10 1 39.9	11.870	17	12 47 54.32	1.8848	S. 0° 8 36.3	13.257
18	11 19 52.68	1.8811	9 49 46.3	11.917	18	12 49 47.45	1.8862	0 21 52.0	13.266
19	11 21 45.51	1.8800	9 37 49.9	11.963	19	12 51 40.67	1.8877	0 35 8.2	13.274
20	11 23 38.28	1.8789	9 25 50.8	12.008	20	12 53 33.98	1.8892	0 48 24.9	13.282
21	11 25 30.98	1.8778	9 13 48.9	12.053	21	12 55 27.38	1.8906	1 1 42.0	13.289
22	11 27 23.62	1.8769	9 1 44.4	12.097	22	12 57 20.88	1.8925	1 14 59.4	13.293
23	11 29 16.21	1.8760	8 49 37.3	12.140	23	12 59 14.48	1.8942	1 28 17.1	13.296
24	11 31 8.74	1.8751	N. 8° 37' 27.6	12.182	24	13 1 8.18	1.8959	S. 1° 41' 35.1	13.301

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					WEDNESDAY 15.				
0	^h 13 ^m 1 ^s 8.18	1.9050	S. 1° 41' 35.1	13.301	0	^h 14 ^m 35 ^s 18.86	2.0501	S. 12° 5' 31.3	12.391
1	13 3 1.99	1.9078	1 54 53.2	13.304	1	14 37 22.00	2.0547	12 17 47.3	12.349
2	13 4 55.92	1.9097	2 8 11.5	13.306	2	14 39 25.42	2.0593	12 30 0.4	12.192
3	13 6 49.96	1.9017	2 21 29.9	13.307	3	14 41 29.12	2.0640	12 42 10.4	12.142
4	13 8 44.12	1.9037	2 34 48.3	13.307	4	14 43 33.10	2.0687	12 54 17.4	12.091
5	13 10 38.40	1.9058	2 48 6.7	13.306	5	14 45 37.36	2.0734	13 6 21.3	12.038
6	13 12 32.81	1.9079	3 1 25.0	13.303	6	14 47 41.91	2.0782	13 18 21.9	11.983
7	13 14 27.35	1.9101	3 14 43.1	13.300	7	14 49 46.75	2.0831	13 30 19.2	11.928
8	13 16 22.02	1.9123	3 28 1.0	13.296	8	14 51 51.88	2.0879	13 42 13.2	11.871
9	13 18 16.83	1.9147	3 41 18.6	13.291	9	14 53 57.30	2.0928	13 54 3.7	11.812
10	13 20 11.79	1.9171	3 54 35.9	13.286	10	14 56 3.02	2.0978	14 5 50.7	11.753
11	13 22 6.89	1.9195	4 7 52.9	13.279	11	14 58 9.04	2.1028	14 17 34.1	11.693
12	13 24 2.13	1.9220	4 21 9.4	13.271	12	15 0 15.37	2.1080	14 29 13.9	11.633
13	13 25 57.53	1.9246	4 34 25.4	13.262	13	15 2 22.00	2.1131	14 40 49.9	11.568
14	13 27 53.08	1.9272	4 47 40.9	13.253	14	15 4 28.94	2.1182	14 52 22.1	11.504
15	13 29 48.79	1.9298	5 0 55.8	13.244	15	15 6 36.18	2.1234	15 3 50.4	11.439
16	13 31 44.66	1.9326	5 14 10.0	13.235	16	15 8 43.74	2.1286	15 15 14.8	11.379
17	13 33 40.70	1.9354	5 27 23.4	13.217	17	15 10 51.61	2.1338	15 26 35.1	11.303
18	13 35 36.90	1.9382	5 40 36.0	13.203	18	15 12 59.79	2.1390	15 37 51.2	11.233
19	13 37 33.28	1.9412	5 53 47.8	13.189	19	15 15 8.29	2.1444	15 49 3.1	11.163
20	13 39 29.84	1.9441	6 6 58.7	13.173	20	15 17 17.12	2.1498	16 0 10.8	11.092
21	13 41 26.57	1.9470	6 20 8.6	13.157	21	15 19 26.27	2.1552	16 11 14.1	11.018
22	13 43 23.48	1.9501	6 33 17.5	13.139	22	15 21 35.74	2.1606	16 22 12.9	10.943
23	13 45 20.58	1.9533	S. 6° 46' 25.3	13.120	23	15 23 45.54	2.1660	S. 16° 33' 7.3	10.868
TUESDAY 14.					THURSDAY 16.				
0	13 47 17.88	1.9566	S. 6° 59' 31.9	13.100	0	15 25 55.66	2.1714	S. 16° 43' 57.1	10.791
1	13 49 15.37	1.9598	7 12 37.3	13.079	1	15 28 6.11	2.1769	16 54 42.2	10.719
2	13 51 13.06	1.9631	7 25 41.4	13.057	2	15 30 16.89	2.1825	17 5 22.6	10.639
3	13 53 10.94	1.9664	7 38 44.1	13.033	3	15 32 28.01	2.1881	17 15 58.1	10.551
4	13 55 9.03	1.9699	7 51 45.4	13.009	4	15 34 39.46	2.1938	17 26 28.7	10.468
5	13 57 7.33	1.9733	8 4 45.2	12.984	5	15 36 51.24	2.1992	17 30 54.3	10.385
6	13 59 5.83	1.9768	8 17 43.5	12.958	6	15 39 3.36	2.2048	17 47 14.9	10.300
7	14 1 4.55	1.9805	8 30 40.2	12.931	7	15 41 15.82	2.2105	17 57 30.3	10.213
8	14 3 3.49	1.9842	8 43 35.2	12.902	8	15 43 28.62	2.2161	18 7 40.5	10.126
9	14 5 2.65	1.9879	8 56 28.4	12.873	9	15 45 41.75	2.2217	18 17 45.4	10.037
10	14 7 2.04	1.9917	9 9 19.8	12.843	10	15 47 55.22	2.2274	18 27 44.9	9.946
11	14 9 1.06	1.9955	9 22 9.4	12.810	11	15 50 9.04	2.2332	18 37 38.9	9.854
12	14 11 1.50	1.9993	9 34 57.0	12.777	12	15 52 23.20	2.2389	18 47 27.4	9.762
13	14 13 1.58	2.0033	9 47 42.6	12.743	13	15 54 37.70	2.2445	18 57 10.3	9.668
14	14 15 1.90	2.0073	10 0 26.1	12.708	14	15 56 52.54	2.2502	19 6 47.5	9.571
15	14 17 2.46	2.0113	10 13 7.5	12.672	15	15 59 7.73	2.2560	19 16 18.8	9.474
16	14 19 3.26	2.0154	10 25 46.7	12.633	16	16 1 23.26	2.2617	19 25 44.3	9.376
17	14 21 4.31	2.0196	10 38 23.5	12.593	17	16 3 39.14	2.2675	19 35 3.9	9.277
18	14 23 5.61	2.0238	10 50 57.9	12.553	18	16 5 55.36	2.2732	19 44 17.5	9.176
19	14 25 7.17	2.0281	11 3 29.9	12.513	19	16 8 11.92	2.2789	19 53 25.0	9.073
20	14 27 8.98	2.0324	11 15 59.5	12.472	20	16 10 28.83	2.2847	20 2 26.3	8.969
21	14 29 11.05	2.0368	11 28 26.5	12.430	21	16 12 46.08	2.2904	20 11 21.3	8.864
22	14 31 13.39	2.0412	11 40 50.8	12.386	22	16 15 3.67	2.2961	20 20 10.0	8.758
23	14 33 15.90	2.0456	11 53 12.4	12.338	23	16 17 21.61	2.3018	20 28 52.3	8.651
24	14 35 18.86	2.0501	S. 12° 5' 31.3	12.291	24	16 19 39.89	2.3075	S. 20° 37' 28.1	8.542

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
0	16 19 39.89	2.3075	S. 20° 37' 28.1"	8.542	0	18 16 17.93	2.5008	S. 24° 59' 14.9"	1.902
1	16 21 58.51	2.3139	20 45 57.3	8.439	1	18 18 49.70	2.5308	25 1 7.9	1.803
2	16 24 17.47	2.3189	20 54 19.9	8.390	2	18 21 21.63	2.5334	25 2 51.3	1.643
3	16 26 36.78	2.3246	21 2 35.7	8.907	3	18 23 53.71	2.5369	25 4 25.1	1.463
4	16 28 56.43	2.3309	21 10 44.7	8.093	4	18 26 25.94	2.5369	25 5 49.3	1.392
5	16 31 16.41	2.3357	21 18 46.9	7.979	5	18 28 58.30	2.5404	25 7 3.8	1.161
6	16 33 36.72	2.3413	21 26 42.2	7.863	6	18 31 30.79	2.5426	25 8 8.6	0.909
7	16 35 57.37	2.3469	21 34 30.4	7.744	7	18 34 3.41	2.5446	25 9 3.7	0.637
8	16 38 18.35	2.3525	21 42 11.5	7.625	8	18 36 36.14	2.5464	25 9 49.0	0.674
9	16 40 39.67	2.3581	21 49 45.4	7.505	9	18 39 8.98	2.5469	25 10 24.6	0.511
10	16 43 1.32	2.3635	21 57 12.1	7.383	10	18 41 41.93	2.5499	25 10 50.4	0.347
11	16 45 23.29	2.3689	22 4 31.4	7.260	11	18 44 14.97	2.5514	25 11 6.3	0.183
12	16 47 45.59	2.3743	22 11 43.3	7.136	12	18 46 48.10	2.5529	25 11 12.4	- 0.090
13	16 50 8.21	2.3797	22 18 47.7	7.011	13	18 49 21.32	2.5548	25 11 8.7	+ 0.144
14	16 52 31.16	2.3851	22 25 44.6	6.885	14	18 51 54.61	2.5553	25 10 55.1	0.309
15	16 54 54.43	2.3904	22 32 33.9	6.757	15	18 54 27.96	2.5563	25 10 31.6	0.474
16	16 57 18.01	2.3957	22 39 15.5	6.628	16	18 57 1.37	2.5573	25 9 58.2	0.639
17	16 59 41.91	2.4009	22 45 49.3	6.497	17	18 59 34.84	2.5589	25 9 14.9	0.803
18	17 2 6.12	2.4061	22 52 15.2	6.366	18	19 2 8.36	2.5599	25 8 21.8	0.966
19	17 4 30.64	2.4112	22 58 33.2	6.234	19	19 4 41.91	2.5595	25 7 18.7	1.134
20	17 6 55.46	2.4162	23 4 43.3	6.101	20	19 7 15.50	2.5601	25 6 5.7	1.299
21	17 9 20.59	2.4212	23 10 45.3	5.966	21	19 9 49.12	2.5605	25 4 42.8	1.464
22	17 11 46.01	2.4262	23 16 39.2	5.830	22	19 12 22.76	2.5607	25 3 10.0	1.630
23	17 14 11.73	2.4311	S. 23° 22' 24.9"	5.693	23	19 14 56.40	2.5609	S. 25° 1' 27.2"	1.796
SATURDAY 18.					MONDAY 20.				
0	17 16 37.74	2.4359	S. 23° 28' 2.4"	5.556	0	19 17 30.05	2.5609	S. 24° 59' 34.5"	1.961
1	17 19 4.04	2.4406	23 33 31.6	5.417	1	19 20 3.70	2.5608	24 57 31.9	2.126
2	17 21 30.62	2.4453	23 38 52.4	5.276	2	19 22 37.34	2.5606	24 55 19.4	2.292
3	17 23 57.48	2.4500	23 44 4.7	5.135	3	19 25 10.96	2.5602	24 52 56.9	2.457
4	17 26 24.62	2.4546	23 49 8.6	4.993	4	19 27 44.56	2.5597	24 50 24.6	2.621
5	17 28 52.03	2.4591	23 54 3.9	4.850	5	19 30 18.13	2.5592	24 47 42.4	2.786
6	17 31 19.71	2.4635	23 58 50.6	4.706	6	19 32 51.67	2.5586	24 44 50.3	2.950
7	17 33 47.65	2.4678	24 3 28.6	4.561	7	19 35 25.16	2.5578	24 41 48.4	3.114
8	17 36 15.85	2.4721	24 7 57.9	4.415	8	19 37 58.60	2.5569	24 38 36.6	3.278
9	17 38 44.30	2.4763	24 12 18.4	4.267	9	19 40 31.99	2.5559	24 35 15.0	3.442
10	17 41 13.00	2.4804	24 16 30.0	4.119	10	19 43 5.31	2.5547	24 31 43.6	3.605
11	17 43 41.95	2.4844	24 20 32.7	3.970	11	19 45 38.56	2.5535	24 28 2.4	3.768
12	17 46 11.13	2.4883	24 24 26.4	3.820	12	19 48 11.73	2.5522	24 24 11.4	3.931
13	17 48 40.55	2.4922	24 28 11.1	3.670	13	19 50 44.82	2.5508	24 20 10.7	4.093
14	17 51 10.19	2.4959	24 31 46.8	3.519	14	19 53 17.82	2.5493	24 16 0.3	4.255
15	17 53 40.06	2.4996	24 35 13.4	3.367	15	19 55 50.73	2.5477	24 11 40.1	4.417
16	17 56 10.15	2.5032	24 38 30.8	3.214	16	19 58 23.54	2.5459	24 7 10.3	4.577
17	17 58 40.44	2.5068	24 41 39.0	3.060	17	20 0 56.24	2.5440	24 2 30.9	4.737
18	18 1 10.94	2.5100	24 44 38.0	2.906	18	20 3 28.82	2.5421	23 57 41.9	4.896
19	18 3 41.64	2.5133	24 47 27.7	2.750	19	20 6 1.29	2.5401	23 52 43.4	5.055
20	18 6 12.54	2.5165	24 50 8.0	2.593	20	20 8 33.63	2.5379	23 47 35.3	5.214
21	18 8 43.62	2.5195	24 52 38.9	2.436	21	20 11 5.84	2.5357	23 42 17.7	5.373
22	18 11 14.88	2.5225	24 55 0.4	2.279	22	20 13 37.92	2.5334	23 36 50.6	5.530
23	18 13 46.32	2.5254	24 57 12.4	2.121	23	20 16 9.85	2.5309	23 31 14.2	5.685
24	18 16 17.93	2.5282	S. 24° 59' 14.9"	1.962	24	20 18 41.63	2.5284	S. 23° 25' 28.4"	5.841

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 21.					THURSDAY 23.				
0	20 18 41.63	2.5884	S. 23° 25' 28.4"	5.841	0	22 16 2.10	2.3477	S. 16° 4' 8.6"	12.092
1	20 21 13.26	2.5858	23 19 33.3	5.996	1	22 18 22.84	2.3436	15 52 0.1	12.190
2	20 23 44.73	2.5832	23 13 28.9	6.150	2	22 20 43.33	2.3394	15 39 45.8	12.287
3	20 26 16.05	2.5806	23 7 15.3	6.304	3	22 23 3.57	2.3353	15 27 25.7	12.383
4	20 28 47.20	2.5177	23 0 52.5	6.457	4	22 25 23.56	2.3319	15 14 59.9	12.477
5	20 31 18.17	2.5148	22 54 20.5	6.609	5	22 27 43.31	2.3271	15 2 28.5	12.569
6	20 33 48.97	2.5118	22 47 39.4	6.760	6	22 30 2.81	2.3230	14 49 51.6	12.660
7	20 36 19.59	2.5087	22 40 49.3	6.909	7	22 32 22.07	2.3190	14 37 9.3	12.749
8	20 38 50.02	2.5056	22 33 50.3	7.058	8	22 34 41.09	2.3150	14 24 21.7	12.837
9	20 41 20.26	2.5024	22 26 42.3	7.207	9	22 36 59.87	2.3110	14 11 28.8	12.924
10	20 43 50.31	2.4992	22 19 25.4	7.355	10	22 39 18.41	2.3071	13 58 30.8	13.009
11	20 46 20.16	2.4959	22 11 59.7	7.501	11	22 41 36.72	2.3032	13 45 27.7	13.092
12	20 48 49.82	2.4926	22 4 25.3	7.646	12	22 43 54.79	2.2993	13 32 19.7	13.174
13	20 51 19.27	2.4891	21 56 42.2	7.790	13	22 46 12.63	2.2954	13 19 6.8	13.254
14	20 53 48.51	2.4856	21 48 50.5	7.934	14	22 48 30.24	2.2916	13 5 49.2	13.338
15	20 56 17.54	2.4820	21 40 50.1	8.077	15	22 50 47.62	2.2878	12 52 26.9	13.410
16	20 58 46.35	2.4783	21 32 41.2	8.218	16	22 53 4.77	2.2840	12 39 0.0	13.486
17	21 1 14.94	2.4747	21 24 23.9	8.358	17	22 55 21.70	2.2802	12 25 28.6	13.560
18	21 3 43.32	2.4711	21 15 58.2	8.497	18	22 57 38.41	2.2765	12 11 52.8	13.632
19	21 6 11.47	2.4673	21 7 24.2	8.636	19	22 59 54.90	2.2728	11 58 12.7	13.703
20	21 8 39.39	2.4634	20 58 41.9	8.773	20	23 2 11.17	2.2694	11 44 28.4	13.773
21	21 11 7.08	2.4596	20 49 51.4	8.909	21	23 4 27.22	2.2658	11 30 39.9	13.842
22	21 13 34.54	2.4557	20 40 52.8	9.043	22	23 6 43.06	2.2623	11 16 47.4	13.908
23	21 16 1.77	2.4518	S. 20° 31' 46.2"	9.177	23	23 8 58.70	2.2589	S. 11° 2' 51.0"	13.972
WEDNESDAY 22.					FRIDAY 24.				
0	21 18 28.76	2.4478	S. 20° 22' 31.6"	9.310	0	23 11 14.13	2.2556	S. 10° 48' 50.8"	14.035
1	21 20 55.51	2.4438	20 13 9.0	9.440	1	23 13 29.36	2.2522	10 34 46.8	14.097
2	21 23 22.02	2.4398	20 3 38.7	9.569	2	23 15 44.39	2.2488	10 20 39.2	14.157
3	21 25 48.29	2.4358	19 54 0.7	9.698	3	23 17 59.21	2.2454	10 6 28.0	14.215
4	21 28 14.31	2.4317	19 44 15.0	9.826	4	23 20 13.84	2.2422	9 52 13.4	14.272
5	21 30 40.09	2.4276	19 34 21.6	9.952	5	23 22 28.28	2.2391	9 37 55.4	14.328
6	21 33 5.62	2.4234	19 24 20.7	10.077	6	23 24 42.53	2.2360	9 23 34.1	14.383
7	21 35 30.90	2.4193	19 14 12.3	10.201	7	23 26 56.60	2.2329	9 9 9.6	14.433
8	21 37 55.93	2.4152	19 3 56.6	10.322	8	23 29 10.48	2.2298	8 54 42.1	14.483
9	21 40 20.72	2.4111	18 53 33.6	10.443	9	23 31 24.18	2.2269	8 40 11.6	14.533
10	21 42 45.26	2.4068	18 43 3.4	10.563	10	23 33 37.71	2.2241	8 25 38.2	14.580
11	21 45 9.54	2.4025	18 32 26.0	10.682	11	23 35 51.07	2.2212	8 11 2.0	14.626
12	21 47 33.56	2.3983	18 21 41.6	10.798	12	23 38 4.25	2.2183	7 56 23.1	14.670
13	21 49 57.33	2.3941	18 10 50.2	10.914	13	23 40 17.26	2.2156	7 41 41.6	14.719
14	21 52 20.85	2.3899	17 59 51.9	11.028	14	23 42 30.12	2.2130	7 26 57.6	14.754
15	21 54 44.12	2.3857	17 48 46.8	11.141	15	23 44 42.82	2.2102	7 12 11.1	14.794
16	21 57 7.13	2.3814	17 37 35.0	11.252	16	23 46 55.36	2.2077	6 57 22.3	14.832
17	21 59 29.89	2.3772	17 26 16.5	11.362	17	23 49 7.74	2.2051	6 42 31.3	14.868
18	22 1 52.39	2.3729	17 14 51.8	11.471	18	23 51 19.97	2.2027	6 27 38.2	14.903
19	22 4 14.64	2.3687	17 3 20.0	11.578	19	23 53 32.06	2.2003	6 12 43.0	14.938
20	22 6 36.64	2.3645	16 51 42.1	11.683	20	23 55 44.01	2.1980	5 57 45.9	14.967
21	22 8 58.38	2.3603	16 39 58.0	11.787	21	23 57 55.82	2.1957	5 42 47.0	14.997
22	22 11 19.87	2.3561	16 28 7.7	11.890	22	0 0 7.49	2.1934	5 27 46.3	15.026
23	22 13 41.11	2.3519	16 16 11.2	11.992	23	0 2 19.02	2.1911	5 12 43.9	15.053
24	22 16 2.10	2.3477	S. 16° 4' 8.6"	12.092	24	0 4 30.42	2.1889	S. 4° 57' 40.0"	15.078

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
0	h m s	s	S. ° ' "	"	0	h m s	s	N. ° ' "	"
1	0 4 30.42	2.1890	4 57 40.0	15.078	1	1 48 18.21	2.1583	7 5 46.2	14.488
2	0 6 41.70	2.1870	4 42 34.6	15.109	2	1 50 27.73	2.1590	7 20 14.0	14.430
3	0 8 52.86	2.1851	4 27 27.8	15.133	3	1 52 37.29	2.1596	7 34 38.9	14.390
4	0 11 3.91	2.1839	4 12 19.8	15.143	4	1 54 46.90	2.1606	7 49 0.8	14.339
5	0 13 14.84	2.1813	3 57 10.6	15.169	5	1 56 56.58	2.1614	8 3 19.6	14.267
6	0 15 25.66	2.1795	3 42 0.3	15.180	6	1 59 6.27	2.1633	8 17 35.2	14.239
7	0 17 36.38	2.1777	3 26 49.0	15.196	7	2 1 16.04	2.1633	8 31 47.5	14.177
8	0 19 46.99	2.1760	3 11 36.8	15.210	8	2 3 25.87	2.1643	8 45 56.4	14.191
9	0 21 57.50	2.1744	2 56 23.8	15.223	9	2 5 35.76	2.1653	9 0 2.0	14.064
10	0 24 7.92	2.1729	2 41 10.0	15.235	10	2 7 45.71	2.1664	9 14 4.1	14.066
11	0 26 18.25	2.1714	2 25 55.6	15.244	11	2 9 55.73	2.1676	9 28 2.6	13.944
12	0 28 28.49	2.1699	2 10 40.7	15.259	12	2 12 5.62	2.1687	9 41 57.4	13.869
13	0 30 38.64	2.1685	1 55 25.4	15.268	13	2 14 15.97	2.1698	9 55 48.5	13.819
14	0 32 48.71	2.1672	1 40 9.7	15.283	14	2 16 26.20	2.1711	10 9 35.7	13.754
15	0 34 58.70	2.1659	1 24 53.8	15.297	15	2 18 36.51	2.1724	10 23 19.0	13.689
16	0 37 8.62	2.1648	1 9 37.7	15.309	16	2 20 46.89	2.1737	10 36 58.4	13.609
17	0 39 18.47	2.1637	0 54 21.5	15.320	17	2 22 57.35	2.1750	10 50 33.7	13.554
18	0 41 28.26	2.1626	0 39 5.4	15.327	18	2 25 7.89	2.1764	11 4 4.9	13.485
19	0 43 37.98	2.1615	0 23 49.5	15.334	19	2 27 18.52	2.1779	11 17 31.9	13.414
20	0 45 47.64	2.1606	S. 0 8 33.8	15.340	20	2 29 29.24	2.1793	11 30 54.6	13.342
21	0 47 57.25	2.1597	N. 0 6 41.7	15.355	21	2 31 40.04	2.1807	11 44 13.0	13.269
22	0 50 6.81	2.1589	0 21 56.8	15.347	22	2 33 50.93	2.1822	11 57 26.9	13.194
23	0 52 16.32	2.1580	0 37 11.4	15.336	23	2 36 1.91	2.1836	12 10 36.3	13.118
24	0 54 25.79	2.1574	N. 0 52 25.4	15.327	24	2 38 12.99	2.1854	N. 12 23 41.1	13.040
SUNDAY 26.					TUESDAY 28.				
0	0 56 35.21	2.1567	N. 1 7 38.7	15.216	0	2 40 24.16	2.1870	N. 12 36 41.3	12.964
1	0 58 44.60	2.1561	1 22 51.3	15.203	1	2 42 35.43	2.1886	12 49 36.8	12.885
2	1 0 53.95	2.1556	1 38 3.0	15.188	2	2 44 46.80	2.1902	13 2 27.5	12.803
3	1 3 3.27	2.1552	1 53 13.8	15.179	3	2 46 58.26	2.1916	13 15 13.2	12.781
4	1 5 12.57	2.1548	2 8 23.6	15.153	4	2 49 9.82	2.1936	13 27 54.0	12.639
5	1 7 21.85	2.1544	2 23 32.2	15.133	5	2 51 21.49	2.1954	13 40 29.9	12.556
6	1 9 31.10	2.1541	2 38 39.6	15.119	6	2 53 33.27	2.1972	13 53 0.7	12.470
7	1 11 40.34	2.1539	2 53 45.7	15.090	7	2 55 45.15	2.1989	14 5 26.3	12.383
8	1 13 49.57	2.1537	3 8 50.4	15.067	8	2 57 57.14	2.2007	14 17 46.7	12.296
9	1 15 58.79	2.1536	3 23 53.7	15.049	9	3 0 9.23	2.2024	14 30 1.9	12.206
10	1 18 8.00	2.1535	3 38 55.4	15.015	10	3 2 21.43	2.2042	14 42 11.7	12.118
11	1 20 17.21	2.1535	3 53 55.5	14.967	11	3 4 33.74	2.2061	14 54 16.1	12.027
12	1 22 26.42	2.1536	4 8 53.8	14.957	12	3 6 46.16	2.2079	15 6 15.0	11.935
13	1 24 35.64	2.1537	4 23 50.3	14.926	13	3 8 58.69	2.2097	15 18 8.3	11.848
14	1 26 44.86	2.1538	4 38 44.9	14.893	14	3 11 11.33	2.2116	15 29 56.1	11.749
15	1 28 54.09	2.1540	4 53 37.4	14.858	15	3 13 24.08	2.2135	15 41 38.2	11.654
16	1 31 3.24	2.1543	5 8 27.8	14.823	16	3 15 36.95	2.2154	15 53 14.6	11.556
17	1 33 12.61	2.1546	5 23 16.1	14.787	17	3 17 49.93	2.2173	16 4 45.2	11.461
18	1 35 21.89	2.1549	5 38 2.2	14.748	18	3 20 3.02	2.2193	16 16 9.9	11.363
19	1 37 31.19	2.1553	5 52 45.9	14.706	19	3 22 16.23	2.2211	16 27 28.7	11.264
20	1 39 40.53	2.1559	6 7 27.2	14.667	20	3 24 29.55	2.2229	16 38 41.6	11.164
21	1 41 49.90	2.1564	6 22 5.9	14.624	21	3 26 42.98	2.2248	16 49 48.4	11.063
22	1 43 59.30	2.1570	6 36 42.0	14.580	22	3 28 56.53	2.2267	17 0 49.1	10.961
23	1 46 8.74	2.1576	6 51 15.5	14.535	23	3 31 10.19	2.2287	17 11 43.7	10.858
24	1 48 18.21	2.1583	N. 7 5 46.2	14.488	24	3 33 23.97	2.2306	N. 17 22 32.1	10.754

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 29.					FRIDAY 31.				
0	3 33 23.97	2.3306	N.17° 22' 32.1"	10.754	0	5 22 18.73	2.2943	N.23° 44' 23.5"	4.932
1	3 35 37.86	2.3325	17 33 14.2	10.649	1	5 24 36.40	2.2946	23 49 15.4	4.799
2	3 37 51.87	2.3344	17 43 50.0	10.543	2	5 26 54.08	2.2948	23 53 59.4	4.667
3	3 40 5.99	2.3363	17 54 19.4	10.437	3	5 29 11.78	2.2950	23 58 35.4	4.534
4	3 42 20.22	2.3382	18 4 42.4	10.339	4	5 31 29.48	2.2950	24 3 3.4	4.401
5	3 44 34.57	2.3401	18 14 58.9	10.221	5	5 33 47.18	2.2951	24 7 23.5	4.267
6	3 46 49.03	2.3419	18 25 8.9	10.112	6	5 36 4.89	2.2951	24 11 35.5	4.134
7	3 49 3.60	2.3438	18 35 12.3	10.002	7	5 38 22.59	2.2949	24 15 39.5	4.001
8	3 51 18.28	2.3457	18 45 9.1	9.891	8	5 40 40.28	2.2948	24 19 35.6	3.868
9	3 53 33.08	2.3476	18 54 59.2	9.778	9	5 42 57.97	2.2946	24 23 23.7	3.735
10	3 55 47.99	2.3493	19 4 42.5	9.665	10	5 45 15.64	2.2943	24 27 3.8	3.601
11	3 58 3.00	2.3510	19 14 19.0	9.552	11	5 47 33.29	2.2939	24 30 35.8	3.468
12	4 0 18.11	2.3528	19 23 48.7	9.438	12	5 49 50.91	2.2934	24 33 59.9	3.335
13	4 2 33.33	2.3546	19 33 11.5	9.323	13	5 52 8.50	2.2930	24 37 16.0	3.201
14	4 4 48.66	2.3563	19 42 27.4	9.208	14	5 54 26.07	2.2926	24 40 24.0	3.067
15	4 7 4.09	2.3581	19 51 36.4	9.092	15	5 56 43.61	2.2920	24 43 24.0	2.933
16	4 9 19.63	2.3598	20 0 38.4	8.974	16	5 59 1.11	2.2913	24 46 16.0	2.800
17	4 11 35.27	2.3614	20 9 33.3	8.856	17	6 1 18.56	2.2905	24 49 0.0	2.666
18	4 12 51.00	2.3630	20 18 21.1	8.737	18	6 3 35.97	2.2897	24 51 35.9	2.532
19	4 16 6.83	2.3647	20 27 1.8	8.618	19	6 5 53.33	2.2888	24 54 3.8	2.399
20	4 18 22.76	2.3663	20 35 35.3	8.498	20	6 8 10.63	2.2879	24 56 23.8	2.266
21	4 20 38.78	2.3678	20 44 1.5	8.377	21	6 10 27.88	2.2869	24 58 35.8	2.133
22	4 22 54.90	2.3694	20 52 20.5	8.256	22	6 12 45.06	2.2858	25 0 39.8	2.000
23	4 25 11.11	2.3709	N.21 0 32.2	8.134	23	6 15 2.18	2.2847	N.25 2 35.8	1.867
THURSDAY 30.					SATURDAY, NOVEMBER 1.				
0	4 27 27.40	2.3723	N.21 8 36.6	8.012	0	6 17 19.23	2.2836	N.25 4 23.9	1.735
1	4 29 43.78	2.3738	21 16 33.7	7.889					
2	4 32 0.25	2.3752	21 24 23.3	7.765					
3	4 34 16.80	2.3765	21 32 5.5	7.641					
4	4 36 33.43	2.3778	21 39 40.2	7.516					
5	4 38 50.14	2.3791	21 47 7.4	7.391					
6	4 41 6.92	2.3803	21 54 27.1	7.265					
7	4 43 23.78	2.3815	22 1 39.2	7.139					
8	4 45 40.70	2.3826	22 8 43.8	7.012					
9	4 47 57.69	2.3837	22 15 40.7	6.884					
10	4 50 14.75	2.3848	22 22 29.9	6.757					
11	4 52 31.87	2.3858	22 29 11.5	6.629					
12	4 54 49.05	2.3868	22 35 45.4	6.500					
13	4 57 6.29	2.3877	22 42 11.5	6.371					
14	4 59 23.58	2.3886	22 48 29.9	6.242					
15	5 1 40.92	2.3894	22 54 40.6	6.113					
16	5 3 58.31	2.3901	23 0 43.5	5.983					
17	5 6 15.74	2.3908	23 6 38.5	5.853					
18	5 8 33.21	2.3913	23 12 25.7	5.721					
19	5 10 50.72	2.3921	23 18 5.0	5.590					
20	5 13 8.26	2.3927	23 23 36.5	5.459					
21	5 15 25.84	2.3932	23 29 0.1	5.327					
22	5 17 43.45	2.3937	23 34 15.8	5.196					
23	5 20 1.08	2.3940	23 39 23.6	5.064					
24	5 22 18.73	2.3943	N.23 44 21.5	4.932					
					PHASES OF THE MOON.				
					<div>☾ Last Quarter . . Oct. 5 8 23.3</div> <div>● New Moon 13 11 5.0</div> <div>☾ First Quarter 20 17 36.5</div> <div>○ Full Moon 27 11 41.9</div>				
					<div>☾ Apogee Oct. 8 2.0</div> <div>☾ Perigee 23 22.0</div>				

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut W.	75 7 17	9667	76 44 41	9689	78 21 46	9697	79 58 30	9713
	α Pegasi W.	58 36 38	3049	60 5 49	3049	61 35 2	3049	63 4 14	3051
	Pollux E.	64 54 3	2490	63 12 36	2508	61 31 35	2508	59 50 58	2544
	Regulus E.	100 58 28	2492	99 17 3	2510	97 36 2	2528	95 55 25	2545
2	Fomalhaut W.	87 56 46	2786	89 31 19	2813	91 5 29	2831	92 39 17	2849
	α Pegasi W.	70 29 4	3081	71 57 37	3090	73 26 0	3100	74 54 10	3110
	α Arietis W.	26 57 16	3236	28 22 53	3183	29 49 23	3149	31 16 33	3193
	Pollux E.	51 34 11	2636	49 56 5	2654	48 18 23	2672	46 41 5	2680
	Regulus E.	87 38 27	2632	86 0 16	2650	84 22 30	2668	82 45 5	2685
	Sun E.	128 32 41	2984	127 2 8	3001	125 31 57	3019	124 2 8	3037
3	Fomalhaut W.	100 22 32	2938	101 54 3	2956	103 25 11	2974	104 55 56	2993
	α Pegasi W.	82 11 38	3170	83 38 23	3183	85 4 51	3197	86 31 4	3211
	α Arietis W.	38 38 25	3059	40 7 25	3055	41 36 30	3054	43 5 36	3055
	Pollux E.	38 40 39	2780	37 5 45	2798	35 31 14	2815	33 57 6	2833
	Regulus E.	74 43 47	2769	73 8 38	2786	71 33 50	2803	69 50 22	2819
	Sun E.	116 38 29	3124	115 10 49	3141	113 43 29	3157	112 16 28	3173
4	α Pegasi W.	93 37 53	3285	95 2 22	3300	96 26 34	3316	97 50 28	3331
	α Arietis W.	50 30 37	3070	51 59 23	3075	53 28 3	3080	54 56 37	3086
	Aldebaran W.	18 53 16	3001	20 23 28	3001	21 53 39	3008	23 23 49	3009
	Regulus E.	62 12 2	2990	60 39 28	2993	59 7 13	2916	57 35 14	2928
	Sun E.	105 6 10	3250	103 41 0	3264	102 16 6	3278	100 51 29	3292
5	α Arietis W.	62 17 35	3117	63 45 24	3123	65 13 6	3129	66 40 41	3134
	Aldebaran W.	30 54 7	3090	32 28 54	3095	33 53 34	3031	35 23 7	3037
	Regulus E.	49 59 26	2989	48 29 0	3000	46 58 48	3011	45 28 49	3021
	Sun E.	93 52 6	3351	92 28 54	3362	91 5 54	3373	89 43 7	3388
6	α Arietis W.	73 56 54	3160	75 23 51	3165	76 50 42	3169	78 17 28	3173
	Aldebaran W.	42 49 7	3065	44 18 0	3070	45 46 48	3074	47 15 30	3078
	Regulus E.	38 1 57	3069	36 33 9	3078	35 4 31	3086	33 36 3	3094
	Sun E.	82 51 43	3493	81 29 53	3499	80 8 11	3437	78 46 36	3443
7	α Arietis W.	85 30 18	3188	86 56 42	3190	88 23 3	3191	89 49 23	3193
	Aldebaran W.	54 37 58	3091	56 6 19	3093	57 34 37	3094	59 2 54	3095
	Sun E.	72 0 6	3464	70 39 2	3467	69 18 0	3469	67 57 1	3471
8	Aldebaran W.	66 24 12	3093	67 52 30	3091	69 20 50	3089	70 49 12	3087
	Pollux W.	22 21 18	3139	23 48 40	3139	25 16 13	3125	26 43 56	3118
	Sun E.	61 12 27	3473	59 51 33	3479	58 30 38	3471	57 9 41	3470
9	Aldebaran W.	78 11 51	3071	79 40 36	3067	81 9 26	3062	82 38 22	3057
	Pollux W.	34 4 22	3064	35 32 51	3077	37 1 27	3071	38 30 11	3065
	Sun E.	50 24 22	3455	49 3 8	3459	47 41 50	3446	46 20 28	3444
10	Aldebaran W.	90 4 40	3028	91 34 18	3022	93 4 3	3015	94 33 58	3008
	Pollux W.	45 55 52	3031	47 25 26	3094	48 55 9	3017	50 25 1	3009
	Sun E.	39 32 18	3419	38 10 23	3413	36 48 21	3406	35 26 14	3403
11	Aldebaran W.	102 5 44	2970	103 36 34	2969	105 7 35	2954	106 38 45	2948

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LUNAR DISTANCES.

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1	Fomalhaut W.	81° 34' 53"	9739	83° 10' 54"	9745	84° 46' 33"	9702	86° 21' 51"	9779
	α Pegasi W.	64 33 24	3054	66 2 29	3059	67 31 29	3065	69 0 21	3073
	Pollux E.	58 10 46	9563	56 31 0	9581	54 51 39	9599	53 12 42	9617
	Regulus E.	94 15 12	9582	92 35 25	9580	90 56 1	9596	89 17 2	9615
2	Fomalhaut W.	94 12 41	9867	95 45 42	9864	97 18 21	9801	98 50 38	9890
	α Pegasi W.	76 22 8	3191	77 49 52	3139	79 17 22	3144	80 44 38	3158
	α Arietis W.	32 44 15	3101	34 12 23	3085	35 40 51	3073	37 9 33	3085
	Pollux E.	45 4 12	9708	43 27 43	9736	41 51 39	9744	40 15 57	9762
	Regulus E.	81 8 4	9709	79 31 27	9719	77 55 11	9736	76 19 19	9753
	Sun E.	122 32 41	3055	121 3 36	3071	119 34 53	3089	118 6 30	3107
3	Fomalhaut W.	106 26 18	3011	107 56 19	3029	109 25 56	3047	110 55 11	3065
	α Pegasi W.	87 57 0	3225	89 22 39	3240	90 48 1	3255	92 13 5	3269
	α Arietis W.	44 34 41	3056	46 3 45	3057	47 32 47	3060	49 1 44	3065
	Pollux E.	32 23 21	9852	30 50 0	9870	29 17 2	9887	27 44 26	9906
	Regulus E.	68 25 17	9835	66 51 32	9849	65 18 5	9863	63 44 55	9877
	Sun E.	110 49 47	3189	109 23 25	3205	107 57 22	3220	106 31 37	3235
4	α Pegasi W.	99 14 4	3347	100 37 21	3369	102 0 21	3378	103 23 2	3385
	α Arietis W.	56 25 3	3092	57 53 22	3099	59 21 34	3105	60 49 38	3112
	Aldebaran W.	24 53 59	3003	26 24 9	3005	27 54 14	3010	29 24 14	3016
	Regulus E.	56 3 34	9942	54 32 9	9954	53 1 0	9966	51 30 6	9978
	Sun E.	99 27 7	3305	98 3 1	3317	96 39 9	3329	95 15 31	3340
5	α Arietis W.	68 8 8	3140	69 35 29	3145	71 2 44	3150	72 29 52	3155
	Aldebaran W.	36 52 32	3043	38 21 51	3049	39 51 3	3055	41 20 8	3060
	Regulus E.	43 59 3	3031	42 29 29	3041	41 0 7	3051	39 30 57	3060
	Sun E.	88 20 30	3392	86 58 4	3400	85 35 48	3408	84 13 41	3416
6	α Arietis W.	79 44 10	3177	81 10 47	3180	82 37 21	3183	84 3 51	3186
	Aldebaran W.	48 44 7	3061	50 12 40	3064	51 41 9	3068	53 9 35	3069
	Regulus E.	32 7 46	3109	30 39 39	3111	29 11 43	3119	27 43 57	3126
	Sun E.	77 25 7	3448	76 3 45	3453	74 42 28	3458	73 21 15	3461
7	α Arietis W.	91 15 41	3194	92 41 57	3194	94 8 13	3195	95 34 27	3195
	Aldebaran W.	60 31 10	3098	61 59 25	3098	63 27 40	3095	64 55 56	3094
	Sun E.	66 36 4	3472	65 15 9	3472	63 54 15	3473	62 33 21	3473
8	Aldebaran W.	72 17 36	3085	73 46 4	3089	75 14 35	3079	76 43 11	3075
	Pollux W.	28 11 47	3110	29 39 44	3103	31 7 49	3096	32 36 2	3090
	Sun E.	55 48 42	3468	54 27 42	3466	53 6 38	3463	51 45 32	3460
9	Aldebaran W.	84 7 24	3052	85 36 33	3046	87 5 48	3040	88 35 10	3034
	Pollux W.	39 59 3	3059	41 28 3	3052	42 57 10	3045	44 26 27	3038
	Sun E.	44 59 0	3439	43 37 28	3435	42 15 50	3430	40 54 7	3425
10	Aldebaran W.	96 4 0	3001	97 34 12	2994	99 4 33	2987	100 35 3	2979
	Pollux W.	51 55 4	3001	53 25 16	2993	54 55 38	2985	56 26 11	2977
	Sun E.	34 4 1	3396	32 41 42	3393	31 19 18	3387	29 56 47	3383
11	Aldebaran W.	108 10 6	2938	109 41 38	2929	111 13 20	2921	112 45 14	2912

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11	POLLUX	W.	57 56 54	2968	59 27 47	2959	60 58 52	2950	62 30 6	2941
	SUN	E.	28 34 10	3379	27 11 30	3375	25 48 45	3379	24 25 56	3371
15	SUN	W.	18 26 15	3113	19 54 9	3090	21 22 31	3071	22 51 16	3052
	MARS	E.	64 20 0	2895	62 47 35	2887	61 14 59	2879	59 42 10	2868
	α Aquilæ	E.	79 46 33	3449	78 25 12	3449	77 3 51	3451	75 42 31	3454
	JUPITER	E.	82 33 36	2685	80 56 36	2676	79 19 24	2667	77 42 0	2658
16	SUN	W.	30 20 26	2975	31 51 11	2962	33 22 11	2950	34 53 27	2939
	MARS	E.	51 55 17	2893	50 21 19	2815	48 47 10	2806	47 12 50	2798
	α Aquilæ	E.	68 57 26	3495	67 36 56	3509	66 16 41	3525	64 56 44	3543
	JUPITER	E.	69 32 10	2617	67 53 38	2609	66 14 56	2601	64 36 3	2593
17	SUN	W.	42 23 15	2886	44 5 52	2876	45 38 42	2866	47 11 43	2857
	MARS	E.	39 18 27	2756	37 43 2	2749	36 7 27	2741	34 31 41	2733
	JUPITER	E.	56 18 58	2655	54 39 1	2648	52 58 55	2641	51 18 39	2634
	α Aquilæ	E.	58 22 56	3677	57 5 44	3713	55 49 11	3756	54 33 23	3801
	Fomalhaut	E.	86 17 4	2703	84 40 28	2696	83 3 42	2689	81 26 48	2683
	α Pegasi	E.	104 10 15	2962	102 39 15	2949	101 7 59	2936	99 36 26	2924
18	SUN	W.	54 59 50	2812	56 34 2	2803	58 8 25	2795	59 42 58	2788
	JUPITER	E.	42 54 53	2501	41 13 41	2495	39 32 19	2489	37 50 49	2483
	α Aquilæ	E.	48 28 9	4198	47 18 32	4215	46 10 20	4314	45 3 40	4425
	Fomalhaut	E.	73 20 25	2659	71 42 50	2655	70 5 10	2650	68 27 25	2650
	α Pegasi	E.	91 55 17	2877	90 22 29	2869	88 49 30	2863	87 16 23	2856
19	SUN	W.	67 38 30	2747	69 14 8	2739	70 49 57	2731	72 25 56	2723
	Antares	W.	25 35 55	2500	27 17 7	2494	28 58 43	2489	30 40 42	2485
	VENUS	W.	24 24 42	2753	26 0 12	2739	27 36 9	2713	29 12 31	2696
	JUPITER	E.	29 21 18	2458	27 39 5	2453	25 56 45	2449	24 14 20	2447
	Fomalhaut	E.	60 18 10	2647	58 40 19	2649	57 2 30	2652	55 24 45	2655
	α Pegasi	E.	79 29 10	2837	77 55 30	2836	76 21 49	2835	74 48 7	2836
20	SUN	W.	80 28 24	2685	82 5 24	2678	83 42 34	2671	85 19 53	2664
	Antares	W.	39 15 0	2397	40 58 39	2388	42 42 32	2379	44 26 38	2370
	VENUS	W.	37 19 27	2699	38 57 43	2617	40 36 15	2605	42 15 3	2595
	Fomalhaut	E.	47 17 56	2698	45 41 13	2719	44 4 49	2729	42 28 48	2750
	α Pegasi	E.	67 0 9	2854	65 26 51	2861	63 53 42	2870	62 20 45	2881
21	SUN	W.	93 28 51	2629	95 7 7	2622	96 45 30	2616	98 24 3	2610
	Antares	W.	53 10 10	2330	54 55 26	2323	56 40 53	2316	58 26 30	2309
	VENUS	W.	50 32 26	2548	52 12 33	2539	53 52 52	2531	55 33 22	2523
	α Pegasi	E.	54 40 17	2968	53 9 24	2993	51 39 2	3022	50 9 16	3055
	α Arietis	E.	95 9 26	2419	93 26 19	2413	91 43 3	2407	89 59 38	2401
22	SUN	W.	106 38 49	2581	108 18 10	2576	109 57 37	2573	111 37 10	2568
	Antares	W.	67 16 55	2279	69 3 26	2273	70 50 5	2267	72 36 52	2262
	VENUS	W.	63 58 36	2485	65 40 10	2479	67 21 52	2473	69 3 43	2467
	MARS	W.	26 29 31	2477	28 11 17	2472	29 53 10	2466	31 35 11	2463
	α Arietis	E.	81 20 39	2378	79 36 32	2374	77 52 20	2371	76 8 3	2368
23	SUN	W.	119 56 29	2548	121 36 35	2545	123 16 46	2543	124 57 0	2540

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11	POLLUX	W.	64° 1' 35"	2932	65° 33' 13"	2923	67° 5' 3"	2914	68° 37' 5"	2905
	SUN	E.	23 3 6	3371	21 40 17	3372	20 17 28	3374	18 54 40	3378
15	SUN	W.	24 20 25	3034	25 49 56	3016	27 19 48	3001	28 49 59	2989
	MARS	E.	58 9 10	2859	56 35 59	2850	55 2 36	2841	53 29 2	2833
	α Aquilæ	E.	74 21 16	3459	73 0 6	3465	71 39 3	3473	70 18 9	3483
	JUPITER	E.	76 4 25	2650	74 26 38	2641	72 48 40	2633	71 10 31	2625
16	SUN	W.	36 24 57	2927	37 56 41	2916	39 28 39	2906	41 0 50	2896
	MARS	E.	45 38 20	2789	44 3 38	2781	42 28 45	2772	40 53 41	2765
	α Aquilæ	E.	63 37 6	3564	62 17 52	3568	60 59 3	3615	59 40 43	3644
	JUPITER	E.	62 56 59	2585	61 17 44	2577	59 38 19	2569	57 58 43	2562
17	SUN	W.	48 44 57	2848	50 18 23	2839	51 52 0	2830	53 25 49	2821
	MARS	E.	32 55 45	2795	31 19 38	2718	29 43 20	2710	28 6 53	2701
	JUPITER	E.	49 38 13	2597	47 57 37	2590	46 16 52	2513	44 35 57	2507
	α Aquilæ	E.	53 18 22	3654	52 4 15	3613	50 51 8	3578	49 39 3	4046
	Fomalhaut	E.	79 49 46	2678	78 12 36	2673	76 35 18	2668	74 57 55	2663
	α Pegasi	E.	98 4 39	2913	96 32 37	2903	95 0 23	2894	93 27 56	2885
18	SUN	W.	61 17 43	2779	62 52 39	2771	64 27 45	2763	66 3 2	2755
	JUPITER	E.	36 9 10	2477	34 27 24	2472	32 45 29	2467	31 3 27	2462
	α Aquilæ	E.	43 58 41	4550	42 55 33	4688	41 54 22	4644	40 55 22	5025
	Fomalhaut	E.	66 49 38	2648	65 11 48	2647	63 33 56	2646	61 56 3	2646
	α Pegasi	E.	85 43 9	2851	84 9 47	2847	82 36 19	2843	81 2 47	2840
19	SUN	W.	74 2 5	2716	75 38 24	2708	77 14 54	2700	78 51 34	2692
	Antares	W.	32 22 58	2441	34 5 32	2423	35 48 27	2418	37 31 36	2408
	VENUS	W.	30 49 14	2681	32 26 19	2666	34 3 44	2653	35 41 27	2640
	JUPITER	E.	22 31 52	2448	20 49 26	2450	19 7 2	2451	17 24 40	2453
	Fomalhaut	E.	53 47 5	2660	52 9 32	2668	50 32 9	2675	48 54 56	2685
	α Pegasi	E.	73 14 25	2837	71 40 45	2839	70 7 8	2842	68 33 35	2848
20	SUN	W.	86 57 22	2657	88 35 0	2650	90 12 48	2643	91 50 45	2636
	Antares	W.	46 10 56	2361	47 55 27	2353	49 40 10	2345	51 25 4	2337
	VENUS	W.	43 54 4	2585	45 33 20	2575	47 12 49	2566	48 52 31	2557
	Fomalhaut	E.	40 53 14	2775	39 18 13	2803	37 43 49	2835	36 10 6	2874
	α Pegasi	E.	60 48 2	2894	59 15 35	2908	57 43 26	2925	56 11 39	2945
21	SUN	W.	100 2 44	2604	101 41 34	2596	103 20 31	2592	104 59 37	2586
	Antares	W.	60 12 16	2302	61 58 13	2296	63 44 18	2290	65 30 33	2284
	VENUS	W.	57 14 4	2515	58 54 56	2507	60 36 0	2500	62 17 13	2492
	α Pegasi	E.	48 40 11	3093	47 11 53	3136	45 44 27	3184	44 17 59	3240
	α Arietis	E.	88 16 5	2396	86 32 24	2391	84 48 35	2386	83 4 40	2382
22	SUN	W.	113 16 51	2564	114 56 37	2559	116 36 29	2554	118 16 27	2551
	Antares	W.	74 23 45	2258	76 10 46	2254	77 57 53	2250	79 45 6	2246
	VENUS	W.	70 45 43	2462	72 27 50	2456	74 10 6	2451	75 52 28	2446
	MARS	W.	33 17 18	2457	34 59 31	2453	36 41 51	2450	38 24 14	2446
	α Arietis	E.	74 23 43	2367	72 39 21	2365	70 54 56	2364	69 10 29	2364
23	SUN	W.	126 37 16	2538	128 17 36	2537	129 57 58	2536	131 38 20	2536

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23	Antares W.	81° 32' 24"	2243	83° 19' 48"	2240	85° 7' 16"	2237	86° 54' 49"	2235
	Venus W.	77 34 58	2441	79 17 34	2437	81 0 16	2433	82 43 4	2430
	Mars W.	40 6 44	2443	41 49 18	2439	43 31 57	2436	45 14 40	2433
	α Arietis E.	67 26 2	2364	65 41 35	2365	63 57 10	2366	62 12 46	2368
	Aldebaran E.	97 36 33	2240	95 49 5	2237	94 1 32	2234	92 13 55	2232
24	Venus W.	91 18 8	2417	93 1 18	2416	94 44 30	2415	96 27 43	2415
	Mars W.	53 48 59	2426	55 31 55	2426	57 14 51	2426	58 57 48	2426
	α Aquilæ W.	54 44 26	3446	56 5 51	3393	57 28 15	3346	58 51 33	3304
	Jupiter W.	41 18 50	2247	43 6 6	2246	44 53 23	2245	46 40 44	2245
	α Arietis E.	53 32 13	2326	51 48 33	2405	50 5 6	2416	48 21 54	2422
25	Aldebaran E.	83 15 9	2225	81 27 18	2225	79 39 27	2225	77 51 37	2225
	Mars W.	67 32 16	2436	69 15 0	2438	70 57 40	2442	72 40 15	2445
	α Aquilæ W.	65 58 53	3148	67 26 4	3128	68 53 40	3110	70 21 38	3093
	Jupiter W.	55 37 10	2251	57 24 21	2254	59 11 27	2258	60 58 29	2261
	α Arietis E.	39 51 15	2224	38 10 35	2253	36 30 34	2284	34 51 17	2222
26	Aldebaran E.	68 52 50	2235	67 5 15	2238	65 17 44	2242	63 30 19	2247
	α Aquilæ W.	77 45 25	3047	79 14 39	3045	80 43 56	3044	82 13 14	3044
	Jupiter W.	60 52 5	2226	71 38 25	2229	73 24 35	2229	75 10 36	2227
	Fomalhaut W.	43 12 31	2229	44 50 46	2212	46 29 24	2209	48 8 20	2206
	Aldebaran E.	54 35 8	2276	52 48 33	2263	51 2 9	2222	49 15 58	2200
27	Pollux E.	98 41 54	2261	96 54 57	2267	95 8 10	2274	93 21 33	2281
	α Aquilæ W.	89 38 51	3074	91 7 32	3085	92 36 0	3096	94 4 14	3111
	Jupiter W.	83 57 43	2250	85 42 29	2260	87 27 1	2271	89 11 18	2281
	Fomalhaut W.	56 25 42	2266	58 5 24	2266	59 45 6	2267	61 24 45	2270
	α Pegasi W.	42 5 57	3332	43 29 32	3276	44 54 11	3230	46 19 45	3189
28	Aldebaran E.	40 28 30	2254	38 43 49	2266	36 59 26	2280	35 15 23	2298
	Pollux E.	84 31 20	2224	82 45 56	2234	81 0 46	2245	79 15 52	2255
	Jupiter W.	97 48 40	2441	99 31 16	2454	101 13 34	2467	102 55 34	2481
	Fomalhaut W.	69 41 32	2261	71 20 25	2210	72 59 7	2219	74 37 36	2222
	α Pegasi W.	53 37 31	3061	55 6 30	3047	56 35 44	3035	58 5 13	3027
29	Pollux E.	70 35 22	2414	68 52 7	2426	67 9 11	2439	65 26 34	2453
	Regulus E.	106 40 17	2419	104 57 9	2432	103 14 19	2445	101 31 47	2458
	Fomalhaut W.	82 46 20	2269	84 23 15	2202	85 59 52	2216	87 36 10	2230
	α Pegasi W.	65 34 27	3014	67 4 23	3016	68 34 16	3019	70 4 5	3024
	Pollux E.	56 58 22	2226	55 17 45	2241	53 37 28	2256	51 57 32	2271
30	Regulus E.	93 3 52	2227	91 23 16	2241	89 43 0	2256	88 3 4	2271
	α Pegasi W.	77 31 13	3064	79 0 7	3074	80 28 48	3086	81 57 15	3097
	α Arietis W.	33 53 39	3014	35 23 34	3000	36 53 47	2990	38 24 12	2982
	Pollux E.	43 43 14	2251	42 5 28	2267	40 28 4	2284	38 51 3	2201
	Regulus E.	79 48 33	2246	78 10 41	2262	76 33 10	2278	74 55 59	2283
31	α Pegasi W.	89 15 43	3165	90 42 34	3180	92 9 7	3194	93 35 23	3210
	α Arietis W.	45 57 40	2277	47 28 21	2281	48 58 57	2285	50 29 28	2291
	Pollux E.	30 51 31	2286	29 16 45	2266	27 42 24	2282	26 8 25	2243
	Regulus E.	66 55 14	2269	65 20 5	2284	63 45 17	2299	62 10 47	2214

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23	Antares	W.	88° 42' 25"	9233	90° 30' 4"	9231	92° 17' 46"	9229	94° 5' 30"	9226
	VENUS	W.	84 25 56	9426	86 8 53	9423	87 51 55	9421	89 35 0	9419
	MARS	W.	46 57 27	9431	48 40 17	9430	50 23 9	9429	52 6 3	9427
	α Arietis	E.	60 28 27	9272	58 44 12	9277	57 0 4	9282	55 16 4	9289
	Aldebaran	E.	90 26 15	9230	88 38 32	9228	86 50 46	9227	85 2 58	9226
24	VENUS	W.	98 10 56	9415	99 54 10	9416	101 37 22	9416	103 20 34	9417
	MARS	W.	60 40 47	9426	62 23 43	9426	64 6 36	9430	65 49 28	9433
	α Aquilæ	W.	60 15 40	9365	61 40 32	9331	63 6 4	9301	64 32 12	9172
	JUPITER	W.	48 28 4	9346	50 15 23	9347	52 2 41	9348	53 49 57	9250
	α Arietis	E.	46 39 0	9443	44 56 26	9459	43 14 15	9477	41 32 30	9499
	Aldebaran	E.	76 3 47	9227	74 15 59	9228	72 28 13	9230	70 40 30	9232
25	MARS	W.	74 22 45	9450	76 5 8	9455	77 47 24	9461	79 29 32	9466
	α Aquilæ	W.	71 49 56	9379	73 18 31	9368	74 47 20	9359	76 16 20	9352
	JUPITER	W.	62 45 26	9265	64 32 17	9269	66 19 0	9274	68 5 37	9280
	α Arietis	E.	33 12 52	9267	31 35 28	9290	29 59 15	9290	28 24 14	9249
	Aldebaran	E.	61 43 1	9251	59 55 50	9257	58 8 47	9263	56 21 53	9269
26	α Aquilæ	W.	83 42 32	9347	85 11 46	9351	86 40 56	9357	88 9 58	9365
	JUPITER	W.	76 56 25	9315	78 42 3	9293	80 27 29	9231	82 12 43	9240
	Fomalhaut	W.	49 47 31	9580	51 26 53	9574	53 6 24	9569	54 46 1	9567
	Aldebaran	E.	47 29 59	9310	45 44 14	9290	43 58 44	9231	42 13 29	9242
	Pollux	E.	91 35 6	9289	89 48 51	9297	88 2 48	9206	86 16 57	9215
27	α Aquilæ	W.	95 32 10	9197	96 59 47	9143	98 27 4	9163	99 53 58	9184
	JUPITER	W.	90 55 19	9292	92 39 5	9405	94 22 33	9416	96 5 45	9436
	Fomalhaut	W.	63 4 21	9574	64 43 51	9560	66 23 13	9566	68 2 27	9563
	α Pegasi	W.	47 46 7	9155	49 13 10	9125	50 40 49	9100	52 8 58	9078
	Aldebaran	E.	33 31 42	9411	31 48 23	9428	30 5 28	9445	28 22 58	9465
	Pollux	E.	77 31 13	9266	75 46 50	9278	74 2 43	9290	72 18 54	9402
28	JUPITER	W.	104 37 14	9494	106 18 36	9509	107 59 37	9522	109 40 19	9538
	Fomalhaut	W.	76 15 52	9540	77 53 53	9552	79 31 38	9563	81 9 7	9575
	α Pegasi	W.	59 34 52	9320	61 4 40	9316	62 34 33	9314	64 4 30	9313
	Pollux	E.	63 44 16	9468	62 2 18	9482	60 20 39	9497	58 39 21	9511
	Regulus	E.	99 49 34	9471	98 7 40	9485	96 26 4	9499	94 44 49	9513
29	Fomalhaut	W.	89 12 10	9745	90 47 50	9760	92 23 10	9776	93 58 9	9792
	α Pegasi	W.	71 33 48	9330	73 3 24	9337	74 32 51	9345	76 2 8	9355
	Pollux	E.	50 17 57	9587	48 38 44	9602	46 59 52	9619	45 21 23	9634
	Regulus	E.	86 23 28	9586	84 44 14	9601	83 5 19	9616	81 26 46	9631
30	α Pegasi	W.	83 25 28	9110	84 53 26	9123	86 21 8	9136	87 48 34	9150
	α Arietis	W.	39 54 47	9277	41 25 28	9275	42 56 12	9274	44 26 57	9276
	Pollux	W.	37 14 23	9718	35 28 7	9735	34 2 14	9751	32 26 42	9767
	Regulus	E.	73 19 9	9708	71 42 40	9734	70 6 32	9739	68 30 43	9754
31	α Pegasi	W.	95 1 19	9227	96 26 56	9243	97 52 15	9260	99 17 13	9277
	α Arietis	W.	51 59 52	9207	53 30 9	9204	55 0 17	9211	56 30 18	9218
	Pollux	E.	24 34 53	9264	23 1 49	9284	21 29 9	9295	19 56 56	9292
	Regulus	E.	60 36 37	9286	59 2 45	9243	57 29 13	9257	55 55 59	9271

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour	Semi-diameter.			
		^h ^m ^s	^s	S. [°] ['] ["]	["]	['] ["]	^s	^m ^s	^s
Sat.	1	14 26 31.31	9.802	S. 14 30' 47.5	-47.96	16' 9.83	66.97	16 19.94	0.053
SUN.	2	14 30 26.96	9.837	14 49 51.7	47.38	16 10.07	67.09	16 20.84	0.019
Mon.	3	14 34 23.43	9.871	15 8 41.5	46.77	16 10.31	67.20	16 20.92	0.015
Tues.	4	14 38 20.74	9.906	15 27 16.6	-46.15	16 10.55	67.32	16 20.17	0.050
Wed.	5	14 42 18.89	9.941	15 45 36.5	45.51	16 10.79	67.43	16 18.57	0.085
Thur.	6	14 46 17.90	9.976	16 3 40.8	44.85	16 11.02	67.55	16 16.13	0.120
Frid.	7	14 50 17.76	10.012	16 21 29.1	-44.17	16 11.25	67.67	16 12.83	0.156
Sat.	8	14 54 18.48	10.048	16 39 1.2	43.48	16 11.48	67.79	16 8.67	0.192
SUN.	9	14 58 20.07	10.084	16 56 16.5	42.77	16 11.71	67.91	16 3.65	0.228
Mon.	10	15 2 22.52	10.120	17 13 14.4	-42.04	16 11.93	68.03	15 57.77	0.264
Tues.	11	15 6 25.83	10.156	17 29 54.6	41.29	16 12.16	68.15	15 51.04	0.300
Wed.	12	15 10 29.99	10.192	17 46 16.8	40.53	16 12.38	68.27	15 43.46	0.335
Thur.	13	15 14 35.01	10.227	18 2 20.4	-39.75	16 12.60	68.39	15 35.02	0.370
Frid.	14	15 18 40.88	10.262	18 18 5.1	38.96	16 12.81	68.51	15 25.74	0.405
Sat.	15	15 22 47.58	10.297	18 33 30.5	38.14	16 13.03	68.63	15 15.62	0.440
SUN.	16	15 26 55.11	10.331	18 48 36.2	-37.31	16 13.24	68.74	15 4.67	0.474
Mon.	17	15 31 3.47	10.365	19 3 21.8	36.46	16 13.45	68.86	14 52.89	0.508
Tues.	18	15 35 12.65	10.399	19 17 46.8	35.60	16 13.66	68.97	14 40.31	0.542
Wed.	19	15 39 22.64	10.433	19 31 50.8	-34.72	16 13.87	69.09	14 26.92	0.576
Thur.	20	15 43 33.43	10.466	19 45 33.5	33.82	16 14.07	69.20	14 12.72	0.609
Frid.	21	15 47 45.02	10.499	19 58 54.5	32.91	16 14.27	69.31	13 57.73	0.642
Sat.	22	15 51 57.39	10.531	20 11 53.6	-31.99	16 14.46	69.42	13 41.97	0.674
SUN.	23	15 56 10.53	10.563	20 24 30.3	31.05	16 14.65	69.53	13 25.43	0.706
Mon.	24	16 0 24.44	10.595	20 36 44.3	30.10	16 14.84	69.64	13 8.13	0.738
Tues.	25	16 4 39.10	10.627	20 48 35.3	-29.14	16 15.02	69.74	12 50.07	0.769
Wed.	26	16 8 54.51	10.657	21 0 2.9	28.16	16 15.20	69.84	12 31.26	0.799
Thur.	27	16 13 10.65	10.687	21 11 6.8	27.17	16 15.37	69.94	12 11.72	0.829
Frid.	28	16 17 27.50	10.717	21 21 46.9	-26.16	16 15.53	70.04	11 51.48	0.859
Sat.	29	16 21 45.07	10.746	21 32 2.7	25.14	16 15.69	70.14	11 30.54	0.888
SUN.	30	16 26 3.33	10.774	21 41 54.0	24.11	16 15.84	70.23	11 8.90	0.916
Mon.	31	16 30 22.27	10.802	S. 21 51 20.4	-23.07	16 15.99	70.32	10 46.58	0.944

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sideral time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Sat.	1	^h 14 ^m 26 ^s 33.98	^s 9.803	S. 14° 31' 0.6"	-47.96	^m 16 ^s 19.95	^s 0.053	^h 14 ^m 42 ^s 53.92
SUN.	2	14 30 29.64	9.837	14 50 4.6	47.37	16 20.84	0.019	14 46 50.48
Mon.	3	14 34 26.12	9.871	15 8 54.3	46.76	16 20.91	0.015	14 50 47.03
Tues.	4	14 38 23.44	9.906	15 27 29.2	-46.14	16 20.15	0.050	14 54 43.59
Wed.	5	14 42 21.60	9.941	15 45 48.9	45.50	16 18.54	0.085	14 58 40.14
Thur.	6	14 46 20.61	9.976	16 3 53.1	44.84	16 16.09	0.120	15 2 36.70
Frid.	7	14 50 20.47	10.012	16 21 41.1	-44.16	16 12.78	0.156	15 6 33.25
Sat.	8	14 54 21.19	10.048	16 39 12.9	43.47	16 8.61	0.192	15 10 29.81
SUN.	9	14 58 22.78	10.084	16 56 27.9	42.76	16 3.58	0.228	15 14 26.36
Mon.	10	15 2 25.22	10.120	17 13 25.6	-42.03	15 57.70	0.264	15 18 22.92
Tues.	11	15 6 25.52	10.156	17 30 5.6	41.28	15 50.96	0.300	15 22 19.48
Wed.	12	15 10 32.67	10.191	17 46 27.5	40.52	15 43.37	0.335	15 26 16.04
Thur.	13	15 14 37.67	10.226	18 2 30.8	-39.74	15 34.93	0.370	15 30 12.59
Frid.	14	15 18 43.51	10.261	18 18 15.2	38.95	15 25.64	0.405	15 34 9.15
Sat.	15	15 22 50.20	10.296	18 33 40.3	38.13	15 15.51	0.440	15 38 5.70
SUN.	16	15 26 57.71	10.330	18 48 45.7	-37.30	15 4.55	0.474	15 42 2.26
Mon.	17	15 31 6.04	10.364	19 3 30.9	36.45	14 52.77	0.508	15 45 58.81
Tues.	18	15 35 15.19	10.398	19 17 55.5	35.59	14 40.18	0.542	15 49 55.37
Wed.	19	15 39 25.15	10.432	19 31 59.1	-34.71	14 26.78	0.576	15 53 51.93
Thur.	20	15 43 35.91	10.465	19 45 41.5	33.81	14 12.58	0.609	15 57 48.49
Frid.	21	15 47 47.46	10.498	19 59 2.2	32.90	13 57.58	0.642	16 1 45.04
Sat.	22	15 51 59.79	10.530	20 12 0.9	-31.98	13 41.81	0.674	16 5 41.60
SUN.	23	15 56 12.89	10.562	20 24 37.3	31.04	13 25.27	0.706	16 9 38.16
Mon.	24	16 0 26.75	10.594	20 36 50.9	30.09	13 7.97	0.738	16 13 34.72
Tues.	25	16 4 41.37	10.625	20 48 41.5	-29.13	12 49.91	0.769	16 17 31.27
Wed.	26	16 8 56.73	10.655	21 0 8.8	28.15	12 31.10	0.799	16 21 27.83
Thur.	27	16 13 12.82	10.685	21 11 12.4	27.16	12 11.56	0.829	16 25 24.38
Frid.	28	16 17 29.62	10.715	21 21 52.1	-26.15	11 51.32	0.859	16 29 20.94
Sat.	29	16 21 47.13	10.744	21 32 7.6	25.13	11 30.37	0.888	16 33 17.50
SUN.	30	16 26 5.33	10.772	21 41 58.5	24.10	11 8.73	0.916	16 37 14.06
Mon.	31	16 30 24.21	10.800	S. 21 51 24.6	-23.06	10 46.41	0.944	16 41 10.62

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+ 9°.8565.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	305	219° 2' 24.5	2' 0.6	150.20	— 0.06	9.9964750	—45.5	9 15 34.81
2	306	220 2 30.4	2 6.3	150.29	+ 0.06	9.9963664	45.0	9 11 38.90
3	307	221 2 38.3	2 14.1	150.38	0.17	9.9962592	44.4	9 7 42.99
4	308	222 2 48.3	2 24.0	150.46	+ 0.26	9.9961532	—43.9	9 3 47.08
5	309	223 3 0.4	2 35.9	150.55	0.33	9.9960484	43.5	8 59 51.17
6	310	224 3 14.6	2 49.9	150.64	0.36	9.9959446	43.1	8 55 55.26
7	311	225 3 30.9	3 6.1	150.72	+ 0.36	9.9958417	—42.7	8 51 59.35
8	312	226 3 49.2	3 24.3	150.80	0.35	9.9957396	42.4	8 48 3.44
9	313	227 4 9.4	3 44.4	150.88	0.30	9.9956384	42.0	8 44 7.53
10	314	228 4 31.4	4 6.2	150.96	+ 0.22	9.9955380	—41.7	8 40 11.62
11	315	229 4 55.2	4 29.8	151.03	0.12	9.9954384	41.3	8 36 15.71
12	316	230 5 20.8	4 55.3	151.10	+ 0.01	9.9953396	41.0	8 32 19.80
13	317	231 5 48.1	5 22.5	151.17	— 0.11	9.9952415	—40.7	8 28 23.89
14	318	232 6 16.9	5 51.1	151.23	0.24	9.9951441	40.4	8 24 27.98
15	319	233 6 47.1	6 21.1	151.29	0.37	9.9950476	40.0	8 20 32.07
16	320	234 7 18.7	6 52.5	151.34	— 0.49	9.9949521	—39.6	8 16 36.16
17	321	235 7 51.6	7 25.3	151.39	0.60	9.9948578	39.1	8 12 40.25
18	322	236 8 25.8	7 59.4	151.45	0.68	9.9947648	38.5	8 8 44.34
19	323	237 9 1.3	8 34.7	151.50	— 0.73	9.9946731	—37.9	8 4 48.43
20	324	238 9 37.9	9 11.1	151.56	0.75	9.9945829	37.2	8 0 52.52
21	325	239 10 15.6	9 48.6	151.61	0.74	9.9944945	36.4	7 56 56.61
22	326	240 10 54.5	10 27.4	151.66	— 0.70	9.9944081	—35.6	7 53 0.70
23	327	241 11 34.5	11 7.3	151.71	0.64	9.9943237	34.7	7 49 4.78
24	328	242 12 15.7	11 48.3	151.75	0.55	9.9942414	33.8	7 45 8.87
25	329	243 12 58.1	12 30.5	151.80	— 0.43	9.9941613	—32.9	7 41 12.96
26	330	244 13 41.7	13 13.9	151.84	0.30	9.9940835	31.9	7 37 17.05
27	331	245 14 26.5	13 58.6	151.89	0.17	9.9940080	30.9	7 33 21.14
28	332	246 15 12.6	14 44.5	151.94	— 0.03	9.9939350	—29.9	7 29 25.23
29	333	247 16 0.0	15 31.7	151.99	+ 0.10	9.9938644	28.9	7 25 29.32
30	334	248 16 48.8	16 20.3	152.05	0.22	9.9937962	27.9	7 21 33.41
31	335	249 17 38.9	17 10.3	152.11	+ 0.31	9.9937303	—27.0	7 17 37.49
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th .								
Diff. for 1 Hour, — 9 ^h . 52 ^m . 26 ^s . (Table II.)								

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15' 9.0	15' 4.2	55' 29.4	-1.54	55' 11.8	-1.39	h m 16 8.4	m 2.16	d 18.5
2	15 0.0	14 56.3	54 56.2	1.22	54 42.8	1.03	16 59.6	2.09	19.5
3	14 53.3	14 51.0	54 31.7	0.82	54 23.1	0.61	17 48.7	2.00	20.5
4	14 49.3	14 48.4	54 17.1	-0.40	54 13.7	-0.17	18 35.4	1.90	21.5
5	14 48.2	14 48.7	54 13.0	+0.05	54 14.9	+0.27	19 20.0	1.82	22.5
6	14 50.0	14 51.8	54 19.4	0.48	54 26.3	0.68	20 2.9	1.77	23.5
7	14 54.4	14 57.5	54 35.6	+0.87	54 47.0	+1.04	20 44.9	1.75	24.5
8	15 1.1	15 5.2	55 0.3	1.18	55 15.3	1.31	21 26.9	1.77	25.5
9	15 9.6	15 14.4	55 31.7	1.41	55 49.2	1.50	22 9.9	1.83	26.5
10	15 19.4	15 24.5	56 7.5	+1.55	56 26.3	+1.58	22 54.9	1.94	27.5
11	15 29.6	15 34.7	56 45.2	1.57	57 3.9	1.54	23 42.9	2.07	28.5
12	15 39.7	15 44.4	57 22.0	1.49	57 39.4	1.40	♄		29.5
13	15 48.8	15 52.9	57 55.6	+1.30	58 10.5	+1.19	0 34.5	2.23	0.9
14	15 56.5	15 59.8	58 24.0	1.06	58 35.9	0.93	1 30.1	2.39	1.9
15	16 2.6	16 4.9	58 46.1	0.79	58 54.7	0.65	2 29.1	2.49	2.9
16	16 6.8	16 8.2	59 1.6	+0.51	59 6.9	+0.39	3 29.7	2.52	3.9
17	16 9.3	16 9.9	59 10.8	0.27	59 13.2	+0.15	4 30.0	2.46	4.9
18	16 10.2	16 10.2	59 14.3	+0.05	59 14.3	-0.05	5 28.0	2.35	5.9
19	16 9.9	16 9.3	59 13.2	-0.15	59 10.9	-0.24	6 22.9	2.22	6.9
20	16 8.4	16 7.2	59 7.6	0.33	59 3.1	0.42	7 14.7	2.11	7.9
21	16 5.7	16 3.9	58 57.6	0.51	58 50.9	0.61	8 4.1	2.04	8.9
22	16 1.7	15 59.3	58 43.1	-0.71	58 34.0	-0.82	8 52.4	2.01	9.9
23	15 56.4	15 53.3	58 23.6	0.92	58 12.0	1.02	9 40.4	2.01	10.9
24	15 49.8	15 46.0	57 59.2	1.12	57 45.2	1.21	10 29.1	2.06	11.9
25	15 41.9	15 37.5	57 30.1	-1.30	57 14.1	-1.37	11 19.2	2.12	12.9
26	15 32.9	15 28.3	56 57.3	1.42	56 40.1	1.45	12 10.9	2.18	13.9
27	15 23.5	15 18.7	56 22.5	1.47	56 5.0	1.45	13 3.9	2.22	14.9
28	15 14.0	15 9.5	55 47.8	-1.41	55 31.1	-1.36	13 57.3	2.21	15.9
29	15 5.2	15 1.3	55 15.4	1.27	55 0.9	1.16	14 49.8	2.15	16.9
30	14 57.7	14 54.6	54 47.8	1.03	54 36.4	0.87	15 40.4	2.05	17.9
31	14 52.0	14 50.0	54 26.9	-0.71	54 19.5	-0.52	16 28.4	1.95	18.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	h m s		N. 25° 4' 23.9"	1.736	0	h m s		N. 24° 0' 53.5"	4.907
1	6 17 19.23	2.9836	25 6 4.0	1.602	1	8 4 27.23	2.1615	23 56 37.7	4.318
2	6 19 36.21	2.9823	25 7 36.2	1.470	2	8 6 36.81	2.1579	23 52 15.3	4.439
3	6 21 53.11	2.9810	25 9 0.4	1.338	3	8 8 46.18	2.1544	23 47 46.2	4.539
4	6 24 9.93	2.9797	25 10 16.7	1.206	4	8 10 55.34	2.1508	23 43 10.6	4.648
5	6 26 26.67	2.9782	25 11 25.1	1.075	5	8 13 4.28	2.1473	23 38 28.5	4.756
6	6 28 43.31	2.9766	25 12 25.7	0.944	6	8 15 13.01	2.1437	23 33 39.9	4.864
7	6 30 59.86	2.9751	25 13 18.4	0.812	7	8 17 21.52	2.1400	23 28 44.8	4.972
8	6 33 16.32	2.9735	25 14 3.2	0.681	8	8 19 29.81	2.1363	23 23 43.3	5.078
9	6 35 32.68	2.9718	25 14 40.1	0.550	9	8 21 37.88	2.1327	23 18 35.5	5.183
10	6 37 48.93	2.9700	25 15 9.2	0.420	10	8 23 45.73	2.1290	23 13 21.4	5.289
11	6 40 5.08	2.9682	25 15 30.5	0.289	11	8 25 53.36	2.1253	23 8 0.9	5.394
12	6 42 21.11	2.9663	25 15 43.9	0.159	12	8 28 0.77	2.1216	23 2 34.1	5.498
13	6 44 37.03	2.9643	25 15 49.6	+ 0.031	13	8 30 7.95	2.1178	22 57 1.1	5.601
14	6 46 52.83	2.9623	25 15 47.6	- 0.098	14	8 32 14.91	2.1141	22 51 22.0	5.703
15	6 49 8.51	2.9603	25 15 37.8	0.297	15	8 34 21.65	2.1104	22 45 36.8	5.804
16	6 51 24.07	2.9582	25 15 20.3	0.355	16	8 36 28.16	2.1067	22 39 45.5	5.906
17	6 53 39.50	2.9561	25 14 55.2	0.482	17	8 38 34.45	2.1029	22 33 48.1	6.007
18	6 55 54.80	2.9538	25 14 22.4	0.610	18	8 40 40.51	2.0992	22 27 44.7	6.106
19	6 58 9.96	2.9515	25 13 42.0	0.738	19	8 42 46.35	2.0954	22 21 35.4	6.205
20	7 0 24.98	2.9492	25 12 53.9	0.865	20	8 44 51.96	2.0917	22 15 20.1	6.304
21	7 2 39.86	2.9468	25 11 58.2	0.991	21	8 46 57.35	2.0879	22 8 58.9	6.403
22	7 4 54.60	2.9444	25 10 55.0	1.116	22	8 49 2.51	2.0842	22 2 31.8	6.500
23	7 7 9.19	2.9419	N. 25 9 44.3	1.242	23	8 51 7.45	2.0804	N. 21 55 59.0	6.595
24	7 9 23.63	2.9393				8 53 12.16	2.0767		
SUNDAY 2.					TUESDAY 4.				
0	7 11 37.91	2.9367	N. 25 8 26.0	1.368	0	8 55 16.65	2.0729	N. 21 49 20.4	6.691
1	7 13 52.04	2.9341	25 7 0.2	1.492	1	8 57 20.91	2.0692	21 42 36.1	6.786
2	7 16 6.00	2.9314	25 5 27.0	1.615	2	8 59 24.95	2.0655	21 35 46.1	6.881
3	7 18 19.80	2.9286	25 3 46.4	1.738	3	9 1 28.77	2.0617	21 28 50.4	6.975
4	7 20 33.43	2.9257	25 1 58.4	1.862	4	9 3 32.36	2.0580	21 21 49.1	7.067
5	7 22 46.89	2.9229	25 0 3.0	1.985	5	9 5 35.73	2.0543	21 14 42.3	7.158
6	7 25 0.18	2.9200	24 58 0.2	2.107	6	9 7 38.88	2.0507	21 7 30.1	7.249
7	7 27 13.29	2.9171	24 55 50.1	2.228	7	9 9 41.81	2.0470	21 0 12.4	7.341
8	7 29 26.23	2.9142	24 53 32.8	2.349	8	9 11 44.52	2.0432	20 52 49.2	7.432
9	7 31 38.99	2.9112	24 51 8.2	2.470	9	9 13 47.00	2.0395	20 45 20.5	7.523
10	7 33 51.57	2.9081	24 48 36.4	2.589	10	9 15 49.26	2.0357	20 37 46.5	7.611
11	7 36 3.96	2.9049	24 45 57.5	2.708	11	9 17 51.31	2.0320	20 30 7.2	7.699
12	7 38 16.16	2.9017	24 43 11.4	2.827	12	9 19 53.14	2.0282	20 22 22.6	7.787
13	7 40 28.17	2.1986	24 40 18.2	2.946	13	9 21 54.75	2.0245	20 14 32.8	7.874
14	7 42 39.99	2.1954	24 37 17.9	3.063	14	9 23 56.15	2.0216	20 6 37.8	7.960
15	7 44 51.62	2.1922	24 34 10.6	3.180	15	9 25 57.34	2.0180	19 58 37.6	8.046
16	7 47 3.05	2.1889	24 30 56.3	3.297	16	9 27 58.31	2.0144	19 50 32.3	8.130
17	7 49 14.28	2.1856	24 27 35.0	3.413	17	9 29 59.07	2.0109	19 42 22.0	8.213
18	7 51 25.32	2.1823	24 24 5.7	3.528	18	9 31 59.62	2.0074	19 34 6.7	8.297
19	7 53 36.16	2.1789	24 20 31.6	3.643	19	9 33 59.96	2.0039	19 25 46.4	8.380
20	7 55 46.79	2.1754	24 16 49.6	3.758	20	9 36 0.09	2.0005	19 17 21.1	8.463
21	7 57 57.21	2.1719	24 13 0.7	3.873	21	9 38 0.02	1.9971	19 8 50.9	8.543
22	8 0 7.42	2.1685	24 9 5.0	3.984	22	9 39 59.75	1.9937	19 0 15.9	8.624
23	8 2 17.43	2.1651	24 5 2.6	4.096	23	9 41 59.27	1.9903	18 51 36.0	8.705
24	8 4 27.23	2.1615	N. 24 0 53.5	4.207	24	9 43 58.59	1.9870	N. 18 42 51.3	8.784

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
0	9 43 58.59	1.9870	N.18° 42' 51.3	8.784	0	11 16 12.32	1.8798	N.10° 22' 12.7	11.897
1	9 45 57.71	1.9837	18 34 1.9	8.883	1	11 18 4.65	1.8716	10 10 21.6	11.875
2	9 47 56.63	1.9804	18 25 7.8	8.941	2	11 19 56.91	1.8704	9 58 27.7	11.922
3	9 49 55.36	1.9779	18 16 9.0	9.018	3	11 21 49.10	1.8683	9 46 31.0	11.968
4	9 51 53.90	1.9740	18 7 5.6	9.085	4	11 23 41.23	1.8683	9 34 31.5	12.014
5	9 53 52.24	1.9708	17 57 57.6	9.179	5	11 25 33.30	1.8673	9 22 29.3	12.059
6	9 55 50.39	1.9676	17 48 45.0	9.248	6	11 27 25.31	1.8684	9 10 24.4	12.103
7	9 57 48.35	1.9645	17 39 27.9	9.399	7	11 29 17.27	1.8686	8 58 16.9	12.147
8	9 59 46.13	1.9614	17 30 6.4	9.595	8	11 31 9.18	1.8646	8 46 6.8	12.190
9	10 1 43.72	1.9583	17 20 40.5	9.668	9	11 33 1.04	1.8640	8 33 54.1	12.239
10	10 3 41.13	1.9553	17 11 10.2	9.541	10	11 34 52.86	1.8633	8 21 38.9	12.274
11	10 5 38.36	1.9524	17 1 35.5	9.614	11	11 36 44.64	1.8627	8 9 21.2	12.315
12	10 7 35.42	1.9485	16 51 56.5	9.685	12	11 38 36.38	1.8621	7 57 1.1	12.355
13	10 9 32.30	1.9445	16 42 13.3	9.756	13	11 40 28.09	1.8616	7 44 38.6	12.395
14	10 11 29.00	1.9436	16 32 25.8	9.897	14	11 42 19.77	1.8611	7 32 13.7	12.434
15	10 13 25.53	1.9408	16 22 34.1	9.896	15	11 44 11.42	1.8607	7 19 46.5	12.479
16	10 15 21.90	1.9381	16 12 38.3	9.964	16	11 46 3.05	1.8604	7 7 17.0	12.510
17	10 17 18.10	1.9353	16 2 38.4	10.039	17	11 47 54.67	1.8609	6 54 45.3	12.547
18	10 19 14.13	1.9325	15 52 34.4	10.100	18	11 49 46.27	1.8599	6 42 11.3	12.584
19	10 21 10.00	1.9298	15 42 26.4	10.167	19	11 51 37.86	1.8597	6 29 35.2	12.619
20	10 23 5.71	1.9279	15 32 14.4	10.233	20	11 53 29.44	1.8597	6 16 57.0	12.654
21	10 25 1.27	1.9246	15 21 58.4	10.299	21	11 55 21.02	1.8596	6 4 16.7	12.688
22	10 26 56.67	1.9221	15 11 38.5	10.364	22	11 57 12.59	1.8596	5 51 34.4	12.722
23	10 28 51.92	1.9197	N.15 1 14.7	10.438	23	11 59 4.17	1.8597	N. 5 38 50.1	12.755
THURSDAY 6.					SATURDAY 8.				
0	10 30 47.03	1.9179	N.14 50 47.1	10.499	0	12 0 55.76	1.8599	N. 5 26 3.8	12.787
1	10 32 41.99	1.9148	14 40 15.7	10.555	1	12 2 47.36	1.8601	5 13 15.6	12.818
2	10 34 36.81	1.9124	14 29 40.5	10.617	2	12 4 38.97	1.8603	5 0 25.6	12.848
3	10 36 31.48	1.9101	14 19 1.6	10.679	3	12 6 30.60	1.8607	4 47 33.8	12.878
4	10 38 26.02	1.9078	14 8 19.0	10.740	4	12 8 22.25	1.8611	4 34 40.2	12.908
5	10 40 20.42	1.9056	13 57 32.8	10.800	5	12 10 13.93	1.8615	4 21 44.8	12.937
6	10 42 14.69	1.9034	13 46 43.0	10.860	6	12 12 5.63	1.8620	4 8 47.7	12.965
7	10 44 8.83	1.9013	13 35 49.6	10.919	7	12 13 57.37	1.8626	3 55 49.0	12.992
8	10 46 2.84	1.8999	13 24 52.7	10.978	8	12 15 49.15	1.8632	3 42 48.7	13.018
9	10 47 56.73	1.8979	13 13 52.2	11.036	9	12 17 40.96	1.8639	3 29 46.8	13.044
10	10 49 50.50	1.8959	13 2 48.3	11.093	10	12 19 32.82	1.8646	3 16 43.4	13.069
11	10 51 44.15	1.8933	12 51 41.0	11.150	11	12 21 24.73	1.8657	3 3 38.6	13.093
12	10 53 37.69	1.8914	12 40 30.3	11.206	12	12 23 16.70	1.8666	2 50 32.3	13.117
13	10 55 31.12	1.8896	12 29 16.3	11.261	13	12 25 8.72	1.8675	2 37 24.6	13.139
14	10 57 24.44	1.8878	12 17 59.0	11.316	14	12 27 0.80	1.8685	2 24 15.6	13.160
15	10 59 17.65	1.8860	12 6 38.4	11.370	15	12 28 52.94	1.8696	2 11 5.4	13.181
16	11 1 10.76	1.8843	11 55 14.6	11.423	16	12 30 45.15	1.8707	1 57 53.9	13.202
17	11 3 3.77	1.8827	11 43 47.6	11.477	17	12 32 37.43	1.8719	1 44 41.2	13.222
18	11 4 56.68	1.8811	11 32 17.4	11.530	18	12 34 29.78	1.8732	1 31 27.3	13.241
19	11 6 49.50	1.8796	11 20 44.1	11.580	19	12 36 22.21	1.8746	1 18 12.3	13.258
20	11 8 42.23	1.8789	11 9 7.8	11.630	20	12 38 14.73	1.8760	1 4 56.3	13.275
21	11 10 34.88	1.8787	10 57 28.5	11.680	21	12 40 7.33	1.8774	0 51 39.3	13.292
22	11 12 27.44	1.8783	10 45 46.2	11.730	22	12 42 0.02	1.8790	0 38 21.3	13.307
23	11 14 19.92	1.8740	10 34 0.9	11.779	23	12 43 52.81	1.8807	0 25 2.4	13.322
24	11 16 12.32	1.8728	N.10 22 12.7	11.827	24	12 45 45.70	1.8824	N. 0 11 42.7	13.335

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	12 ^h 45 ^m 45.70	1.8894	N. 0° 11' 42.7	13.335	0	14 ^h 19 ^m 16.90	2.0391	S. 10° 26' 49.2	12.876
1	12 47 38.69	1.8941	S. 0 1 37.8	13.348	1	14 21 19.39	2.0439	10 39 40.7	12.839
2	12 49 31.79	1.8989	0 14 59.1	13.361	2	14 23 22.17	2.0487	10 52 29.9	12.801
3	12 51 25.00	1.8977	0 28 21.1	13.373	3	14 25 25.24	2.0536	11 5 16.8	12.762
4	12 53 18.32	1.8986	0 41 43.7	13.389	4	14 27 28.60	2.0586	11 18 1.3	12.721
5	12 55 11.75	1.8915	0 55 7.0	13.399	5	14 29 32.27	2.0637	11 30 43.3	12.679
6	12 57 5.30	1.8936	1 8 30.8	13.401	6	14 31 36.24	2.0687	11 43 22.8	12.637
7	12 58 58.98	1.8968	1 21 55.1	13.409	7	14 33 40.51	2.0739	11 55 59.7	12.593
8	13 0 52.80	1.8981	1 35 19.9	13.416	8	14 35 45.10	2.0791	12 8 33.9	12.547
9	13 2 46.75	1.9004	1 48 45.0	13.422	9	14 37 50.00	2.0843	12 21 5.3	12.500
10	13 4 40.84	1.9037	2 2 10.5	13.427	10	14 39 55.21	2.0895	12 33 33.9	12.452
11	13 6 35.07	1.9050	2 15 36.3	13.439	11	14 42 0.74	2.0948	12 45 59.5	12.402
12	13 8 29.44	1.9074	2 29 2.3	13.435	12	14 44 6.59	2.1002	12 58 22.1	12.351
13	13 10 23.96	1.9100	2 42 28.5	13.437	13	14 46 12.77	2.1057	13 10 41.6	12.309
14	13 12 18.64	1.9127	2 55 54.8	13.436	14	14 48 19.27	2.1111	13 22 58.0	12.266
15	13 14 13.48	1.9153	3 9 21.1	13.439	15	14 50 26.10	2.1166	13 35 11.1	12.190
16	13 16 8.48	1.9180	3 22 47.5	13.439	16	14 52 33.26	2.1222	13 47 20.8	12.133
17	13 18 3.64	1.9208	3 36 13.8	13.436	17	14 54 40.76	2.1278	13 59 27.1	12.076
18	13 19 58.97	1.9237	3 49 40.0	13.436	18	14 56 48.60	2.1335	14 11 29.9	12.017
19	13 21 54.48	1.9266	4 3 6.1	13.433	19	14 58 56.78	2.1392	14 23 29.1	11.956
20	13 23 50.16	1.9295	4 16 31.9	13.428	20	15 1 5.30	2.1449	14 35 24.6	11.894
21	13 25 46.02	1.9325	4 29 57.4	13.423	21	15 3 14.17	2.1507	14 47 16.4	11.832
22	13 27 42.06	1.9357	4 43 22.6	13.417	22	15 5 23.38	2.1564	14 59 4.4	11.767
23	13 29 38.30	1.9389	S. 4 56 47.4	13.409	23	15 7 32.94	2.1622	S. 15 10 48.4	11.699
MONDAY 10.					WEDNESDAY 12.				
0	13 31 34.73	1.9429	S. 5 10 11.7	13.401	0	15 9 42.86	2.1689	S. 15 22 28.3	11.631
1	13 33 31.36	1.9455	5 23 35.5	13.392	1	15 11 53.13	2.1742	15 34 4.1	11.562
2	13 35 28.19	1.9482	5 36 58.7	13.380	2	15 14 3.76	2.1801	15 45 35.8	11.492
3	13 37 25.22	1.9509	5 50 21.3	13.371	3	15 16 14.74	2.1860	15 57 3.2	11.420
4	13 39 22.46	1.9537	6 3 43.2	13.357	4	15 18 26.08	2.1921	16 8 26.2	11.347
5	13 41 19.91	1.9563	6 17 4.2	13.343	5	15 20 37.79	2.1982	16 19 44.8	11.279
6	13 43 17.58	1.9630	6 30 24.4	13.329	6	15 22 49.86	2.2042	16 30 58.8	11.195
7	13 45 15.47	1.9667	6 43 43.7	13.314	7	15 25 2.29	2.2103	16 42 8.2	11.117
8	13 47 13.58	1.9704	6 57 2.1	13.297	8	15 27 15.09	2.2164	16 53 12.9	11.038
9	13 49 11.92	1.9742	7 10 19.4	13.279	9	15 29 28.26	2.2226	17 4 12.8	10.957
10	13 51 10.49	1.9789	7 23 35.6	13.261	10	15 31 41.80	2.2287	17 15 7.8	10.875
11	13 53 9.30	1.9828	7 36 50.7	13.242	11	15 33 55.71	2.2349	17 25 57.8	10.791
12	13 55 8.35	1.9868	7 50 4.6	13.221	12	15 36 9.99	2.2411	17 36 42.7	10.706
13	13 57 7.64	1.9908	8 3 17.2	13.196	13	15 38 24.64	2.2473	17 47 22.4	10.618
14	13 59 7.18	1.9943	8 16 28.4	13.174	14	15 40 39.67	2.2536	17 57 56.9	10.531
15	14 1 6.96	1.9985	8 29 38.1	13.149	15	15 42 55.07	2.2599	18 8 26.1	10.443
16	14 3 7.00	2.0026	8 42 46.3	13.123	16	15 45 10.84	2.2662	18 18 49.9	10.350
17	14 5 7.30	2.0072	8 55 52.9	13.097	17	15 47 26.99	2.2723	18 29 8.1	10.257
18	14 7 7.86	2.0116	9 8 57.9	13.069	18	15 49 43.52	2.2785	18 39 20.7	10.163
19	14 9 8.69	2.0160	9 22 1.2	13.039	19	15 52 0.42	2.2848	18 49 27.6	10.067
20	14 11 9.78	2.0204	9 35 2.6	13.008	20	15 54 17.70	2.2911	18 59 28.7	9.969
21	14 13 11.14	2.0250	9 48 2.2	12.977	21	15 56 35.36	2.2974	19 9 23.9	9.870
22	14 15 12.78	2.0297	10 0 59.9	12.945	22	15 58 53.39	2.3037	19 19 13.1	9.769
23	14 17 14.70	2.0344	10 13 55.6	12.911	23	16 1 11.80	2.3100	19 28 56.2	9.668
24	14 19 16.90	2.0391	S. 10 26 49.2	12.876	24	16 3 30.59	2.3162	S. 19 38 33.2	9.565

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	16 ^h 3 ^m 30.59	9.3162	S. 19° 38' 33.2	9.565	0	18 ^h 1 ^m 12.06	9.5617	S. 24° 51' 51.7	3.013
1	16 5 49.75	9.3225	19 48 4.0	9.460	1	18 3 45.85	9.5646	24 54 47.6	2.650
2	16 8 9.29	9.3287	19 57 28.4	9.352	2	18 6 19.81	9.5673	24 57 33.7	2.667
3	16 10 29.20	9.3349	20 6 46.3	9.244	3	18 8 53.93	9.5700	25 0 10.0	2.528
4	16 12 49.48	9.3411	20 15 57.7	9.136	4	18 11 28.21	9.5726	25 2 36.4	2.357
5	16 15 10.13	9.3473	20 25 2.6	9.026	5	18 14 2.64	9.5751	25 4 52.9	2.192
6	16 17 31.16	9.3536	20 34 0.8	8.913	6	18 16 37.22	9.5775	25 6 59.4	2.026
7	16 19 52.56	9.3597	20 42 52.2	8.799	7	18 19 11.94	9.5797	25 8 56.0	1.859
8	16 22 14.32	9.3658	20 51 36.7	8.684	8	18 21 46.78	9.5817	25 10 42.5	1.692
9	16 24 36.45	9.3719	21 0 14.3	8.567	9	18 24 21.74	9.5836	25 12 19.0	1.524
10	16 26 58.95	9.3780	21 8 44.8	8.449	10	18 26 56.81	9.5854	25 13 45.4	1.357
11	16 29 21.81	9.3840	21 17 8.2	8.329	11	18 29 31.99	9.5871	25 15 1.8	1.189
12	16 31 45.03	9.3900	21 25 24.3	8.206	12	18 32 7.26	9.5888	25 16 8.1	1.020
13	16 34 8.61	9.3960	21 33 33.1	8.086	13	18 34 42.62	9.5901	25 17 4.2	0.851
14	16 36 32.55	9.4019	21 41 34.6	7.963	14	18 37 18.07	9.5913	25 17 50.2	0.682
15	16 38 56.84	9.4077	21 49 28.6	7.838	15	18 39 53.58	9.5926	25 18 26.0	0.512
16	16 41 21.48	9.4136	21 57 15.1	7.711	16	18 42 29.15	9.5933	25 18 51.6	0.342
17	16 43 46.47	9.4194	22 4 53.9	7.582	17	18 45 4.78	9.5949	25 19 7.0	0.172
18	16 46 11.81	9.4251	22 12 24.9	7.452	18	18 47 40.46	9.5956	25 19 12.3	-0.002
19	16 48 37.49	9.4308	22 19 48.1	7.322	19	18 50 16.18	9.5956	25 19 7.3	+0.166
20	16 51 3.51	9.4365	22 27 3.5	7.190	20	18 52 51.93	9.5960	25 18 52.1	0.336
21	16 53 29.87	9.4421	22 34 10.9	7.057	21	18 55 27.70	9.5963	25 18 26.7	0.500
22	16 55 56.56	9.4478	22 41 10.3	6.922	22	18 58 3.49	9.5965	25 17 51.0	0.660
23	16 58 23.58	9.4531	S. 22° 48' 1.5	6.785	23	19 0 39.28	9.5964	S. 25° 17' 5.1	0.820
FRIDAY 14.					SUNDAY 16.				
0	17 0 50.93	9.4585	S. 22° 54' 44.5	6.648	0	19 3 15.06	9.5963	S. 25° 16' 9.0	1.000
1	17 3 18.60	9.4637	23 1 19.3	6.510	1	19 5 50.83	9.5961	25 15 2.7	1.191
2	17 5 45.58	9.4689	23 7 45.7	6.369	2	19 8 26.59	9.5958	25 13 46.1	1.380
3	17 8 14.87	9.4741	23 14 3.6	6.226	3	19 11 2.32	9.5953	25 12 19.3	1.532
4	17 10 43.47	9.4792	23 20 13.0	6.082	4	19 13 38.02	9.5947	25 10 42.3	1.702
5	17 13 12.38	9.4843	23 26 13.9	5.943	5	19 16 13.68	9.5938	25 8 55.1	1.872
6	17 15 41.59	9.4892	23 32 6.1	5.798	6	19 18 49.28	9.5928	25 6 57.7	2.041
7	17 18 11.09	9.4941	23 37 49.6	5.652	7	19 21 24.82	9.5916	25 4 50.2	2.210
8	17 20 40.88	9.4988	23 43 24.3	5.504	8	19 24 0.30	9.5907	25 2 32.5	2.379
9	17 23 10.95	9.5035	23 48 50.1	5.356	9	19 26 35.70	9.5893	25 0 4.7	2.548
10	17 25 41.30	9.5081	23 54 7.0	5.207	10	19 29 11.02	9.5879	24 57 26.8	2.716
11	17 28 11.92	9.5126	23 59 14.9	5.056	11	19 31 46.25	9.5863	24 54 38.8	2.883
12	17 30 42.81	9.5170	24 4 13.7	4.904	12	19 34 21.38	9.5847	24 51 40.8	3.051
13	17 33 13.96	9.5213	24 9 3.4	4.750	13	19 36 56.41	9.5828	24 48 32.7	3.217
14	17 35 45.37	9.5256	24 13 43.9	4.596	14	19 39 31.32	9.5808	24 45 14.7	3.383
15	17 38 17.03	9.5298	24 18 15.2	4.444	15	19 42 6.11	9.5788	24 41 46.7	3.550
16	17 40 48.92	9.5335	24 22 37.2	4.288	16	19 44 40.78	9.5768	24 38 8.7	3.716
17	17 43 21.05	9.5375	24 26 49.8	4.132	17	19 47 15.31	9.5743	24 34 20.8	3.880
18	17 45 53.42	9.5413	24 30 53.0	3.975	18	19 49 49.70	9.5720	24 30 23.1	4.044
19	17 48 26.01	9.5450	24 34 46.8	3.817	19	19 52 23.95	9.5695	24 26 15.5	4.207
20	17 50 58.82	9.5485	24 38 31.0	3.657	20	19 54 58.04	9.5668	24 21 58.2	4.370
21	17 53 31.83	9.5519	24 42 5.6	3.497	21	19 57 31.97	9.5641	24 17 31.1	4.532
22	17 56 5.04	9.5552	24 45 30.6	3.337	22	20 0 5.73	9.5619	24 12 54.3	4.693
23	17 58 38.45	9.5585	24 48 46.0	3.176	23	20 2 39.32	9.5598	24 8 7.9	4.854
24	18 1 12.06	9.5617	S. 24° 51' 51.7	3.013	24	20 5 12.72	9.5569	S. 24° 3' 11.8	5.014

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	20 5 12.72	9.5552	S. 24° 3' 11.8"	5.014	0	22 2 59.29	9.3370	S. 17° 18' 23.7"	11.374
1	20 7 45.94	9.5591	23 58 6.2	5.173	1	22 5 19.36	9.3390	17 6 58.2	11.474
2	20 10 18.97	9.5488	23 52 51.0	5.332	2	22 7 39.13	9.3371	16 55 26.8	11.573
3	20 12 51.80	9.5455	23 47 26.4	5.489	3	22 9 58.61	9.3292	16 43 49.5	11.670
4	20 15 24.43	9.5420	23 41 52.4	5.645	4	22 12 17.79	9.3172	16 32 6.4	11.765
5	20 17 56.84	9.5384	23 36 9.0	5.801	5	22 14 36.67	9.3122	16 20 17.7	11.858
6	20 20 29.04	9.5348	23 30 16.3	5.955	6	22 16 55.25	9.3072	16 8 23.4	11.951
7	20 23 1.02	9.5311	23 24 14.4	6.109	7	22 19 13.54	9.3024	15 56 23.6	12.043
8	20 25 32.78	9.5273	23 18 3.3	6.262	8	22 21 31.54	9.2977	15 44 18.3	12.133
9	20 28 4.30	9.5234	23 11 43.0	6.414	9	22 23 49.26	9.2929	15 32 7.7	12.221
10	20 30 35.59	9.5195	23 5 13.6	6.564	10	22 26 6.69	9.2882	15 19 51.8	12.307
11	20 33 6.64	9.5155	22 58 35.3	6.713	11	22 28 23.84	9.2834	15 7 30.8	12.392
12	20 35 37.45	9.5114	22 51 48.1	6.861	12	22 30 40.70	9.2787	14 55 4.7	12.476
13	20 38 8.01	9.5072	22 44 52.0	7.009	13	22 32 57.28	9.2740	14 42 33.7	12.558
14	20 40 38.32	9.5030	22 37 47.0	7.156	14	22 35 13.58	9.2694	14 29 57.8	12.639
15	20 43 8.37	9.4987	22 30 33.3	7.300	15	22 37 29.61	9.2648	14 17 17.0	12.720
16	20 45 38.16	9.4943	22 23 11.0	7.444	16	22 39 45.36	9.2603	14 4 31.4	12.798
17	20 48 7.68	9.4899	22 15 40.0	7.587	17	22 42 0.85	9.2559	13 51 41.2	12.874
18	20 50 36.94	9.4854	22 8 0.5	7.729	18	22 44 16.07	9.2514	13 38 46.5	12.949
19	20 53 5.93	9.4808	22 0 12.5	7.870	19	22 46 31.02	9.2470	13 25 47.3	13.022
20	20 55 34.64	9.4762	21 52 16.1	8.009	20	22 48 45.71	9.2427	13 12 43.8	13.094
21	20 58 3.07	9.4716	21 44 11.4	8.147	21	22 51 0.14	9.2384	12 59 36.0	13.165
22	21 0 31.23	9.4669	21 35 58.4	8.284	22	22 53 14.32	9.2341	12 46 24.0	13.234
23	21 2 59.10	9.4622	S. 21° 27' 37.3"	8.419	23	22 55 28.24	9.2299	S. 12° 33' 7.9"	13.302
TUESDAY 18.					THURSDAY 20.				
0	21 5 26.69	9.4574	S. 21° 19' 8.1"	8.553	0	22 57 41.91	9.2258	S. 12° 19' 47.7"	13.369
1	21 7 53.99	9.4526	21 10 30.9	8.687	1	22 59 55.34	9.2217	12 6 23.6	13.434
2	21 10 21.00	9.4477	21 1 45.7	8.819	2	23 2 8.52	9.2177	11 52 55.6	13.497
3	21 12 47.72	9.4428	20 52 52.6	8.950	3	23 4 21.46	9.2137	11 39 23.9	13.559
4	21 15 14.14	9.4379	20 43 51.7	9.079	4	23 6 34.16	9.2096	11 25 48.5	13.620
5	21 17 40.27	9.4330	20 34 43.1	9.207	5	23 8 46.63	9.2059	11 12 9.5	13.679
6	21 20 6.10	9.4280	20 25 26.9	9.333	6	23 10 58.87	9.2021	10 58 27.0	13.737
7	21 22 31.63	9.4230	20 16 3.1	9.458	7	23 13 10.88	9.1983	10 44 41.1	13.793
8	21 24 56.86	9.4181	20 6 31.9	9.582	8	23 15 22.67	9.1947	10 30 51.8	13.848
9	21 27 21.80	9.4131	19 56 53.3	9.704	9	23 17 34.24	9.1910	10 16 59.3	13.902
10	21 29 46.43	9.4080	19 47 7.4	9.826	10	23 19 45.59	9.1874	10 3 3.6	13.954
11	21 32 10.76	9.4029	19 37 14.2	9.946	11	23 21 56.73	9.1839	9 49 4.8	14.006
12	21 34 34.78	9.3978	19 27 13.9	10.064	12	23 24 7.66	9.1804	9 35 3.0	14.054
13	21 36 58.50	9.3927	19 17 6.5	10.182	13	23 26 18.38	9.1771	9 20 58.3	14.102
14	21 39 21.91	9.3877	19 6 52.1	10.297	14	23 28 28.91	9.1738	9 6 50.8	14.148
15	21 41 45.02	9.3827	18 56 30.9	10.416	15	23 30 39.24	9.1705	8 52 40.5	14.193
16	21 44 7.83	9.3776	18 46 2.9	10.532	16	23 32 49.37	9.1673	8 38 27.6	14.237
17	21 46 30.33	9.3724	18 35 28.1	10.635	17	23 34 59.32	9.1642	8 24 12.1	14.278
18	21 48 52.52	9.3673	18 24 46.7	10.745	18	23 37 9.08	9.1612	8 9 54.2	14.318
19	21 51 14.41	9.3622	18 13 58.7	10.853	19	23 39 18.66	9.1582	7 55 33.9	14.356
20	21 53 35.99	9.3572	18 3 4.3	10.960	20	23 41 28.06	9.1552	7 41 11.2	14.397
21	21 55 57.27	9.3522	17 52 3.5	11.066	21	23 43 37.28	9.1523	7 26 46.2	14.434
22	21 58 18.25	9.3471	17 40 56.4	11.170	22	23 45 46.33	9.1495	7 12 19.1	14.469
23	22 0 38.92	9.3420	17 29 43.1	11.273	23	23 47 55.22	9.1468	6 57 49.9	14.502
24	22 2 59.29	9.3370	S. 17° 18' 23.7"	11.374	24	23 50 3.95	9.1442	S. 6° 43' 18.8"	14.534

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	^h 23 ^m 50 ^s 3.95	2.1449	S. 6° 43' 18.8	14.534	0	^h 1 ^m 31 ^s 14.92	2.0982	N. 5° 6' 1.4	14.512
1	23 52 12.52	2.1416	6 28 45.8	14.566	1	1 33 20.83	2.0969	5 20 31.2	14.479
2	23 54 20.94	2.1390	6 14 10.9	14.596	2	1 35 26.79	2.0996	5 34 58.9	14.445
3	23 56 29.20	2.1365	5 59 34.3	14.624	3	1 37 32.79	2.1004	5 49 24.6	14.411
4	23 58 37.32	2.1349	5 44 56.0	14.652	4	1 39 38.84	2.1013	6 3 48.2	14.374
5	0 0 45.30	2.1319	5 30 16.1	14.677	5	1 41 44.95	2.1022	6 18 9.5	14.336
6	0 2 53.15	2.1297	5 15 34.8	14.700	6	1 43 51.11	2.1033	6 32 28.5	14.297
7	0 5 0.86	2.1275	5 0 52.1	14.723	7	1 45 57.33	2.1042	6 46 45.2	14.257
8	0 7 8.45	2.1254	4 46 8.0	14.745	8	1 48 3.62	2.1053	7 0 59.4	14.216
9	0 9 15.91	2.1233	4 31 22.7	14.764	9	1 50 9.97	2.1064	7 15 11.1	14.173
10	0 11 23.25	2.1214	4 16 36.3	14.783	10	1 52 16.39	2.1076	7 29 20.2	14.129
11	0 13 30.48	2.1195	4 1 48.7	14.802	11	1 54 22.88	2.1088	7 43 26.6	14.084
12	0 15 37.59	2.1177	3 47 0.1	14.818	12	1 56 29.45	2.1101	7 57 30.3	14.038
13	0 17 44.60	2.1160	3 32 10.6	14.833	13	1 58 36.10	2.1115	8 11 31.2	13.991
14	0 19 51.51	2.1143	3 17 20.3	14.845	14	2 0 42.83	2.1129	8 25 29.2	13.941
15	0 21 58.31	2.1126	3 2 29.2	14.857	15	2 2 49.65	2.1144	8 39 24.1	13.890
16	0 24 5.02	2.1111	2 47 37.5	14.867	16	2 4 56.56	2.1159	8 53 16.0	13.839
17	0 26 11.64	2.1096	2 32 45.2	14.877	17	2 7 3.56	2.1175	9 7 4.8	13.787
18	0 28 18.17	2.1082	2 17 52.3	14.885	18	2 9 10.66	2.1191	9 20 50.4	13.733
19	0 30 24.62	2.1069	2 2 59.0	14.891	19	2 11 17.85	2.1207	9 34 32.7	13.678
20	0 32 31.00	2.1056	1 48 5.4	14.897	20	2 13 25.14	2.1224	9 48 11.7	13.622
21	0 34 37.30	2.1044	1 33 11.4	14.903	21	2 15 32.54	2.1242	10 1 47.3	13.564
22	0 36 43.53	2.1033	1 18 17.2	14.904	22	2 17 40.04	2.1259	10 15 19.4	13.505
23	0 38 49.70	2.1023	S. 1 3 22.9	14.905	23	2 19 47.65	2.1277	N. 10 28 47.9	13.444
SATURDAY 22.					MONDAY 24.				
0	0 40 55.81	2.1013	S. 0 48 28.6	14.905	0	2 21 55.37	2.1296	N. 10 42 12.7	13.383
1	0 43 1.86	2.1004	0 33 34.3	14.904	1	2 24 3.20	2.1315	10 55 33.8	13.321
2	0 45 7.86	2.0996	0 18 40.1	14.901	2	2 26 11.15	2.1335	11 8 51.2	13.258
3	0 47 13.81	2.0988	S. 0 3 46.2	14.896	3	2 28 19.22	2.1355	11 22 4.7	13.193
4	0 49 19.72	2.0981	N. 0 11 7.4	14.891	4	2 30 27.41	2.1376	11 35 14.3	13.127
5	0 51 25.59	2.0975	0 26 0.7	14.885	5	2 32 35.73	2.1396	11 48 19.9	13.060
6	0 53 31.42	2.0969	0 40 53.6	14.877	6	2 34 44.17	2.1417	12 1 21.5	12.992
7	0 55 37.22	2.0965	0 55 46.0	14.868	7	2 36 52.73	2.1438	12 14 18.9	12.922
8	0 57 43.00	2.0961	1 10 37.8	14.857	8	2 39 1.43	2.1461	12 27 12.1	12.851
9	0 59 48.75	2.0957	1 25 28.8	14.844	9	2 41 10.26	2.1483	12 40 1.0	12.778
10	1 1 54.48	2.0954	1 40 19.1	14.831	10	2 43 19.22	2.1506	12 52 45.5	12.705
11	1 4 0.20	2.0952	1 55 8.6	14.817	11	2 45 28.32	2.1528	13 5 25.6	12.631
12	1 6 5.90	2.0950	2 9 57.2	14.803	12	2 47 37.56	2.1551	13 18 1.2	12.555
13	1 8 11.60	2.0950	2 24 44.8	14.785	13	2 49 46.93	2.1574	13 30 32.2	12.478
14	1 10 17.30	2.0949	2 39 31.4	14.767	14	2 51 56.45	2.1598	13 42 58.6	12.401
15	1 12 22.99	2.0949	2 54 16.8	14.747	15	2 54 6.11	2.1622	13 55 20.3	12.322
16	1 14 28.69	2.0951	3 9 1.0	14.726	16	2 56 15.91	2.1646	14 7 37.2	12.242
17	1 16 34.40	2.0953	3 23 43.9	14.703	17	2 58 25.86	2.1670	14 19 49.3	12.161
18	1 18 40.12	2.0955	3 38 25.4	14.680	18	3 0 35.95	2.1694	14 31 56.5	12.078
19	1 20 45.86	2.0958	3 53 5.5	14.656	19	3 2 46.19	2.1719	14 43 58.7	11.995
20	1 22 51.62	2.0963	4 7 44.1	14.629	20	3 4 56.58	2.1744	14 55 55.9	11.910
21	1 24 57.40	2.0966	4 22 21.0	14.601	21	3 7 7.12	2.1769	15 7 47.9	11.824
22	1 27 3.21	2.0971	4 36 56.2	14.573	22	3 9 17.81	2.1794	15 19 34.7	11.737
23	1 29 9.05	2.0976	4 51 29.7	14.543	23	3 11 28.65	2.1820	15 31 16.3	11.649
24	1 31 14.92	2.0982	N. 5 6 1.4	14.512	24	3 13 39.65	2.1846	N. 15 42 52.6	11.560

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	3 ^h 13 ^m 39.65 ^s	2.1846	N. 15° 42' 52.6"	11.580	0	5 ^h 1 ^m 22.88 ^s	2.3947	N. 22° 56' 36.4"	6.193
1	3 15 50.80	2.1872	15 54 23.5	11.470	1	5 3 40.60	2.3961	23 2 44.1	6.063
2	3 18 2.11	2.1897	16 5 49.0	11.379	2	5 5 58.41	2.3975	23 8 44.0	5.932
3	3 20 13.57	2.1923	16 17 9.0	11.287	3	5 8 16.30	2.3987	23 14 36.0	5.802
4	3 22 25.19	2.1949	16 28 23.4	11.193	4	5 10 34.26	2.3999	23 20 20.2	5.672
5	3 24 36.96	2.1975	16 39 32.1	11.098	5	5 12 52.29	2.3011	23 25 56.6	5.541
6	3 26 48.89	2.2002	16 50 35.1	11.003	6	5 15 10.39	2.3022	23 31 25.1	5.409
7	3 29 0.98	2.2028	17 1 32.4	10.907	7	5 17 28.56	2.3032	23 36 45.7	5.277
8	3 31 13.23	2.2054	17 12 23.9	10.809	8	5 19 46.78	2.3042	23 41 58.3	5.144
9	3 33 25.63	2.2080	17 23 9.5	10.711	9	5 22 5.06	2.3051	23 47 3.0	5.019
10	3 35 38.19	2.2106	17 33 49.2	10.611	10	5 24 23.39	2.3059	23 51 59.7	4.879
11	3 37 50.91	2.2132	17 44 22.8	10.509	11	5 26 41.77	2.3067	23 56 48.4	4.746
12	3 40 3.78	2.2158	17 54 50.3	10.408	12	5 29 0.19	2.3074	24 1 29.2	4.612
13	3 42 16.81	2.2185	18 5 11.7	10.306	13	5 31 18.65	2.3080	24 6 1.9	4.478
14	3 44 30.00	2.2211	18 15 27.0	10.203	14	5 33 37.15	2.3086	24 10 26.6	4.344
15	3 46 43.34	2.2237	18 25 36.0	10.098	15	5 35 55.68	2.3090	24 14 43.2	4.209
16	3 48 56.84	2.2263	18 35 38.7	9.993	16	5 38 14.23	2.3094	24 18 51.7	4.075
17	3 51 10.50	2.2289	18 45 35.1	9.887	17	5 40 32.81	2.3098	24 22 52.2	3.941
18	3 53 24.31	2.2314	18 55 25.1	9.779	18	5 42 51.41	2.3101	24 26 44.6	3.806
19	3 55 38.27	2.2340	19 5 8.6	9.671	19	5 45 10.02	2.3102	24 30 28.9	3.671
20	3 57 52.39	2.2366	19 14 45.6	9.562	20	5 47 28.63	2.3103	24 34 5.1	3.535
21	4 0 6.66	2.2391	19 24 16.0	9.452	21	5 49 47.25	2.3103	24 37 33.1	3.399
22	4 2 21.08	2.2416	19 33 39.8	9.341	22	5 52 5.87	2.3103	24 40 53.0	3.265
23	4 4 35.65	2.2440	N. 19° 42' 56.9"	9.229	23	5 54 24.48	2.3108	N. 24° 44' 4.9"	3.130
WEDNESDAY 26.					FRIDAY 28.				
0	4 6 50.36	2.2464	N. 19° 52' 7.3"	9.116	0	5 56 43.09	2.3100	N. 24° 47' 8.6"	2.994
1	4 9 5.22	2.2489	20 1 10.9	9.002	1	5 59 1.68	2.3097	24 50 4.2	2.858
2	4 11 20.23	2.2513	20 10 7.6	8.888	2	6 1 20.25	2.3093	24 52 51.6	2.722
3	4 13 35.38	2.2537	20 18 57.5	8.774	3	6 3 38.80	2.3089	24 55 30.9	2.587
4	4 15 50.67	2.2560	20 27 40.5	8.658	4	6 5 57.32	2.3083	24 58 2.0	2.451
5	4 18 6.10	2.2583	20 36 16.5	8.541	5	6 8 15.80	2.3077	25 0 25.0	2.316
6	4 20 21.67	2.2607	20 44 45.4	8.423	6	6 10 34.25	2.3071	25 2 39.9	2.181
7	4 22 37.38	2.2630	20 53 7.3	8.305	7	6 12 52.65	2.3064	25 4 46.7	2.045
8	4 24 53.22	2.2651	21 1 22.0	8.186	8	6 15 11.01	2.3056	25 6 45.3	1.909
9	4 27 9.19	2.2673	21 9 29.6	8.067	9	6 17 29.32	2.3047	25 8 35.7	1.773
10	4 29 25.29	2.2694	21 17 30.0	7.946	10	6 19 47.57	2.3037	25 10 18.0	1.636
11	4 31 41.52	2.2715	21 25 23.1	7.825	11	6 22 5.76	2.3026	25 11 52.3	1.504
12	4 33 57.87	2.2736	21 33 9.0	7.703	12	6 24 23.88	2.3014	25 13 18.5	1.369
13	4 36 14.35	2.2756	21 40 47.5	7.580	13	6 26 41.93	2.3002	25 14 36.6	1.234
14	4 38 30.94	2.2775	21 48 18.6	7.457	14	6 28 59.91	2.2990	25 15 46.6	1.099
15	4 40 47.65	2.2795	21 55 42.4	7.334	15	6 31 17.81	2.2976	25 16 48.5	0.965
16	4 43 4.48	2.2814	22 2 58.7	7.209	16	6 33 35.62	2.2961	25 17 42.4	0.831
17	4 45 21.42	2.2832	22 10 7.5	7.083	17	6 35 53.34	2.2946	25 18 28.3	0.697
18	4 47 38.47	2.2850	22 17 8.7	6.958	18	6 38 10.97	2.2930	25 19 6.1	0.563
19	4 49 55.62	2.2868	22 24 2.4	6.832	19	6 40 28.50	2.2913	25 19 35.9	0.430
20	4 52 12.88	2.2885	22 30 48.5	6.705	20	6 42 45.93	2.2896	25 19 57.7	0.297
21	4 54 30.24	2.2901	22 37 27.0	6.577	21	6 45 3.25	2.2877	25 20 11.6	0.165
22	4 56 47.68	2.2917	22 43 57.8	6.449	22	6 47 20.46	2.2858	25 20 17.5	+ 0.033
23	4 59 5.24	2.2933	22 50 20.3	6.322	23	6 49 37.55	2.2839	25 20 15.5	- 0.099
24	5 1 22.88	2.2947	N. 22° 56' 36.4"	6.193	24	6 51 54.53	2.2819	N. 25° 20' 5.6"	0.931

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
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SATURDAY 29.

h	m	s	s	N.25° 20' 5.6"	0.231
0	6	51	54.53	2.9819	0.309
1	6	54	11.38	2.9797	0.484
2	6	56	28.10	2.9775	0.625
3	6	58	44.68	2.9753	0.755
4	7	1	1.13	2.9730	0.884
5	7	3	17.44	2.9706	1.013
6	7	5	33.60	2.9682	1.143
7	7	7	49.62	2.9657	1.271
8	7	10	5.48	2.9630	1.399
9	7	12	21.18	2.9603	1.526
10	7	14	36.72	2.9576	1.653
11	7	16	52.09	2.9548	1.780
12	7	19	7.30	2.9521	1.906
13	7	21	22.34	2.9492	2.031
14	7	23	37.20	2.9463	2.156
15	7	25	51.88	2.9433	2.280
16	7	28	6.38	2.9401	2.403
17	7	30	20.69	2.9369	2.526
18	7	32	34.81	2.9337	2.649
19	7	34	48.74	2.9305	2.772
20	7	37	2.47	2.9273	2.893
21	7	39	16.01	2.9239	3.013
22	7	41	29.34	2.9205	3.133
23	7	43	42.47	2.9171	

SUNDAY 30.

h	m	s	s	N.24° 37' 40.8"	3.253
0	7	45	55.39	2.9136	3.379
1	7	48	8.10	2.9101	3.490
2	7	50	20.60	2.9065	2.607
3	7	52	32.88	2.9029	3.793
4	7	54	44.95	2.1992	3.840
5	7	56	56.79	2.1955	3.956
6	7	59	8.41	2.1918	4.070
7	8	1	19.31	2.1881	4.184
8	8	3	30.98	2.1843	4.298
9	8	5	41.92	2.1804	4.411
10	8	7	52.63	2.1766	4.526
11	8	10	3.11	2.1727	4.633
12	8	12	13.36	2.1688	4.744
13	8	14	23.37	2.1648	4.855
14	8	16	33.14	2.1608	4.964
15	8	18	42.67	2.1568	5.071
16	8	20	51.96	2.1528	5.178
17	8	23	1.01	2.1488	5.285
18	8	25	9.82	2.1447	5.398
19	8	27	18.38	2.1407	5.498
20	8	29	26.70	2.1366	5.603
21	8	31	34.77	2.1324	5.706
22	8	33	42.59	2.1283	5.809
23	8	35	50.17	2.1241	5.911
24	8	37	57.49	2.1199	

MONDAY, DECEMBER 1.

h	m	s	s	N.22° 46' 52.9"	5.911
0	8	37	57.49	2.1199	

PHASES OF THE MOON.

☾ Last Quarter . . Nov.	d	h	m
● New Moon	12	1	37.6
☾ First Quarter	19	0	44.6
○ Full Moon	26	1	22.8

☾ Apogee. Nov.	d	h
☾ Perigee.	18	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis W.	58 0 9	3035	59 29 51	3033	60 59 23	3041	62 26 45	3049
	Aldebaran W.	26 36 29	2938	28 8 0	2944	29 39 23	2950	31 10 38	2957
	Regulus E.	54 23 3	2884	52 50 24	2898	51 18 4	2919	49 46 0	2925
	SATURN E.	70 30 47	2905	68 58 34	2918	67 26 38	2931	65 54 58	2943
	SUN E.	125 5 39	3239	126 40 16	3252	122 15 9	3265	120 50 17	3278
2	α Arietis W.	69 53 8	3069	71 21 31	3097	72 49 45	3105	74 17 49	3119
	Aldebaran W.	38 44 34	2996	40 14 52	3003	41 45 0	3011	43 14 59	3019
	Regulus E.	42 9 50	2969	40 39 23	3001	39 9 11	3013	37 39 14	3025
	SATURN E.	58 20 26	3001	56 50 14	3011	55 20 15	3022	53 50 29	3031
	SUN E.	113 49 39	3338	112 26 12	3348	111 2 58	3359	109 39 55	3369
3	α Arietis W.	81 36 2	3145	83 3 17	3151	84 30 26	3157	85 57 27	3169
	Aldebaran W.	50 42 42	3052	52 11 51	3058	53 40 53	3063	55 9 48	3067
	Regulus E.	30 13 5	3063	28 44 35	3095	27 16 19	3108	25 48 19	3126
	SATURN E.	46 24 28	3074	44 55 47	3081	43 27 14	3089	41 58 51	3095
	SUN E.	102 47 21	3413	101 25 19	3419	100 3 24	3425	98 41 36	3432
4	α Arietis W.	93 11 8	3183	94 37 37	3186	96 4 2	3189	97 30 24	3191
	Aldebaran W.	62 33 9	3085	64 1 37	3087	65 30 2	3089	66 58 25	3090
	Pollux W.	18 29 51	3143	19 57 9	3137	21 24 35	3131	22 52 7	3125
	SATURN E.	34 38 45	3193	33 11 3	3189	31 43 28	3133	30 15 58	3137
	SUN E.	91 54 11	3454	90 32 56	3457	89 11 44	3460	87 50 35	3462
5	Aldebaran W.	74 20 8	3080	75 48 30	3089	77 16 53	3087	78 45 20	3084
	Pollux W.	30 11 10	3105	31 39 13	3101	33 7 21	3097	34 35 34	3093
	Spica E.	60 38 56	3107	59 10 55	3107	57 42 54	3106	56 14 53	3106
	SUN E.	81 5 9	3463	79 44 3	3461	78 22 56	3459	77 1 46	3457
6	Aldebaran W.	86 8 25	3085	87 37 17	3080	89 6 15	3065	90 35 20	3049
	Pollux W.	41 58 0	3069	43 26 48	3062	44 55 44	3056	46 24 48	3050
	Spica E.	48 54 19	3096	47 26 5	3083	45 57 47	3090	44 29 25	3067
	SUN E.	70 15 6	3438	68 53 32	3432	67 31 51	3426	66 12 4	3419
7	Aldebaran W.	98 2 43	3014	99 32 39	3006	101 2 44	2997	102 33 1	2989
	Pollux W.	53 52 18	3010	55 22 18	3002	56 52 28	2993	58 22 50	2983
	Regulus W.	18 10 23	3196	19 38 1	3104	21 6 6	3084	22 34 35	3063
	Spica E.	37 6 37	3070	35 37 52	3068	34 9 3	3066	32 40 14	3065
	SUN E.	59 19 9	3381	57 56 31	3372	56 33 43	3363	55 10 44	3355
8	Aldebaran W.	110 7 14	2940	111 38 41	2930	113 10 22	2920	114 42 16	2909
	Pollux W.	65 57 41	2931	67 29 20	2921	69 1 11	2910	70 33 17	2899
	Regulus W.	30 3 5	2975	31 33 49	2960	33 4 52	2945	34 36 14	2931
	SUN E.	48 12 56	3300	46 48 45	3289	45 24 20	3277	43 59 42	3265
9	Pollux W.	78 17 29	2939	79 51 6	2927	81 25 0	2915	82 59 9	2902
	Regulus W.	42 17 37	2980	43 50 47	2945	45 24 16	2932	46 58 2	2918
	SUN E.	36 52 56	2904	35 26 51	3191	34 0 30	3178	32 33 54	3166
10	Pollux W.	90 54 6	2737	92 29 57	2725	94 6 4	2712	95 42 28	2700
	Regulus W.	54 51 25	2750	56 26 59	2736	58 2 52	2722	59 39 2	2709
	SUN E.	25 17 4	3103	23 48 58	3091	22 20 37	3079	20 52 2	3089

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
1	α Arietis	W.	63° 57' 56"	3057	65° 27' 0"	3085	66° 55' 53"	3079	68° 24' 35"	3081
	Aldebaran	W.	32 41 44	2985	34 12 41	2973	35 43 29	2981	37 14 6	2988
	Regulus	E.	48 14 14	2939	46 42 44	2951	45 11 30	2964	43 40 32	2976
	SATURN	E.	64 23 34	2955	62 52 25	2987	61 21 31	2979	59 50 52	2989
	SUN	E.	119 25 41	3292	118 1 20	3304	116 37 13	3315	115 13 19	3326
2	α Arietis	W.	75 45 45	3119	77 13 32	3128	78 41 10	3133	80 8 40	3139
	Aldebaran	W.	44 44 48	3026	46 14 29	3032	47 44 1	3039	49 13 25	3046
	Regulus	E.	36 9 31	3036	34 40 3	3048	33 10 49	3060	31 41 50	3072
	SATURN	E.	52 20 55	3040	50 51 32	3049	49 22 20	3056	47 53 19	3066
	SUN	E.	108 17 4	3379	106 54 23	3387	105 31 53	3396	104 9 32	3404
3	α Arietis	W.	87 24 22	3167	88 51 11	3171	90 17 55	3175	91 44 34	3179
	Aldebaran	W.	56 38 38	3071	58 7 23	3075	59 36 2	3079	61 4 37	3082
	Regulus	E.	24 20 34	3137	22 53 9	3154	21 26 5	3171	19 59 21	3186
	SATURN	E.	40 30 35	3101	39 2 27	3107	37 34 26	3113	36 6 32	3119
	SUN	E.	97 19 56	3426	95 58 22	3442	94 36 54	3446	93 15 30	3450
4	α Arietis	W.	98 56 44	3193	100 23 2	3195	101 49 17	3197	103 15 30	3198
	Aldebaran	W.	68 26 47	3091	69 55 7	3091	71 23 27	3091	72 51 47	3091
	Pollux	W.	24 19 44	3120	25 47 29	3116	27 15 18	3113	28 43 12	3109
	SATURN	E.	28 48 33	3142	27 21 14	3146	25 54 0	3150	24 26 51	3156
	SUN	E.	86 29 28	3463	85 8 23	3464	83 47 18	3464	82 26 14	3464
5	Aldebaran	W.	80 13 49	3092	81 42 21	3078	83 10 58	3074	84 39 39	3070
	Pollux	W.	36 3 51	3099	37 32 14	3084	39 0 43	3079	40 29 18	3074
	Spica	E.	54 46 50	3105	53 18 46	3103	51 50 39	3101	50 22 31	3099
	SUN	E.	75 40 34	3454	74 19 18	3450	72 57 50	3446	71 36 35	3442
6	Aldebaran	W.	92 4 32	3043	93 33 52	3036	95 3 20	3032	96 32 57	3022
	Pollux	W.	47 54 0	3043	49 23 20	3035	50 52 50	3027	52 22 29	3019
	Spica	E.	43 0 59	3094	41 32 30	3080	40 3 56	3077	38 35 19	3073
	SUN	E.	64 46 10	3412	63 26 7	3405	62 3 57	3398	60 41 38	3390
7	Aldebaran	W.	104 3 28	2999	105 34 6	2970	107 4 56	2960	108 35 59	2950
	Pollux	W.	59 53 23	2973	61 24 9	2963	62 55 7	2954	64 26 17	2943
	Regulus	W.	24 3 30	3041	25 32 52	3022	27 2 38	3007	28 32 42	2992
	Spica	E.	31 11 21	3064	29 42 27	3065	28 13 34	3066	26 44 41	3067
	SUN	E.	53 47 34	3344	52 24 13	3334	51 0 39	3323	49 36 54	3311
8	Aldebaran	W.	116 14 24	2996	117 46 46	2967	119 19 22	2976	120 52 13	2985
	Pollux	W.	72 5 36	2987	73 38 11	2975	75 11 2	2983	76 44 8	2981
	Regulus	W.	36 7 54	2916	37 39 53	2901	39 12 10	2886	40 44 44	2873
	SUN	E.	42 34 50	3253	41 9 43	3241	39 44 22	3236	38 18 46	3216
9	Pollux	W.	84 33 35	2788	86 8 18	2776	87 43 17	2763	89 18 33	2750
	Regulus	W.	48 32 7	2905	50 6 29	2791	51 41 10	2777	53 16 8	2764
	SUN	E.	31 7 2	3153	29 39 56	3140	28 12 34	3127	26 44 57	3115
10	Pollux	W.	97 19 9	2987	98 56 7	2974	100 33 23	2961	102 10 55	2949
	Regulus	W.	61 15 31	2926	62 52 17	2909	64 29 21	2899	66 6 42	2886
	SUN	E.	19 23 14	3056	17 54 14	3044	16 25 2	3033	14 55 38	3020

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	SUN W.	24 18 14	9731	25 54 13	9799	27 30 26	9713	29 6 49	9704
	JUPITER E.	50 35 7	9318	48 49 34	9313	47 3 54	9309	45 18 8	9306
	Fomalhaut E.	76 49 26	9569	75 9 48	9564	73 30 4	9561	71 50 16	9559
	α Pegasi E.	95 17 44	9809	93 43 19	9794	92 8 43	9787	90 33 58	9780
15	SUN W.	37 11 17	9671	38 48 36	9666	40 26 2	9660	42 3 35	9656
	JUPITER E.	36 28 3	9391	34 41 51	9390	32 55 37	9389	31 9 22	9389
	Fomalhaut E.	63 30 47	9559	61 50 56	9562	60 11 9	9565	58 31 26	9570
	α Pegasi E.	82 38 29	9763	81 3 13	9769	79 27 55	9763	77 52 39	9765
16	SUN W.	50 12 49	9636	51 50 55	9639	53 29 4	9630	55 7 17	9696
	VENUS W.	24 46 10	9396	26 31 31	9316	28 17 7	9307	30 2 56	9299
	Fomalhaut E.	50 15 14	9617	48 36 42	9631	46 58 29	9648	45 20 39	9668
	α Pegasi E.	69 57 23	9799	68 22 44	9801	66 48 18	9819	65 14 6	9825
	α Arietis E.	111 58 13	9445	110 15 43	9440	108 33 4	9435	106 50 19	9430
17	SUN W.	63 19 6	9690	64 57 35	9619	66 36 5	9618	68 14 36	9617
	VENUS W.	38 54 38	9369	40 41 23	9364	42 28 15	9360	44 15 13	9356
	Fomalhaut E.	37 19 28	9890	35 45 26	9865	34 12 22	9919	32 40 27	9961
	α Pegasi E.	57 27 56	9916	55 55 58	9942	54 24 33	9972	52 53 44	3004
	α Arietis E.	98 15 9	9415	96 31 56	9413	94 48 40	9411	93 5 21	9410
18	SUN W.	76 27 23	9615	78 5 57	9616	79 44 31	9617	81 23 4	9617
	VENUS W.	53 11 12	9943	54 58 35	9941	56 46 2	9939	58 33 32	9937
	α Arietis E.	84 28 40	9411	82 45 21	9412	81 2 4	9414	79 18 49	9416
	Aldebaran E.	115 2 15	9312	113 16 32	9319	111 30 50	9319	109 45 7	9312
19	SUN W.	89 35 36	9691	91 14 3	9693	92 52 28	9694	94 30 51	9695
	VENUS W.	67 31 32	9331	69 19 13	9330	71 6 55	9330	72 54 38	9329
	JUPITER W.	21 8 39	9302	22 54 36	9396	24 40 41	9393	26 26 51	9399
	α Arietis E.	70 43 27	9431	69 0 36	9436	67 17 52	9441	65 35 15	9446
	Aldebaran E.	100 56 40	9315	99 11 2	9316	97 25 25	9317	95 39 50	9318
20	SUN W.	102 42 14	9635	104 20 22	9637	105 58 28	9638	107 36 31	9641
	VENUS W.	81 53 21	9999	83 41 6	9999	85 28 50	9999	87 16 34	9999
	α Aquilæ W.	52 8 39	9678	53 25 49	9619	54 44 3	9565	56 3 15	9515
	JUPITER W.	35 18 32	9363	37 4 56	9363	38 51 21	9363	40 37 46	9363
	α Arietis E.	57 4 20	9499	55 22 41	9492	53 41 16	9502	52 0 5	9513
	Aldebaran E.	86 52 27	9396	85 7 6	9392	83 21 49	9330	81 36 35	9333
21	SUN W.	115 45 49	9655	117 23 29	9658	119 1 5	9699	120 38 35	9696
	VENUS W.	96 14 56	9936	98 2 33	9937	99 50 6	9938	101 37 37	9940
	α Aquilæ W.	62 51 20	9394	64 14 52	9307	65 38 55	9363	67 3 26	9363
	JUPITER W.	49 29 30	9369	51 15 45	9391	53 1 58	9399	54 48 9	9394
	α Arietis E.	43 38 46	9592	41 59 40	9613	40 21 3	9637	38 42 58	9665
	Aldebaran E.	72 51 21	9348	71 6 32	9351	69 21 47	9355	67 37 8	9359
22	α Aquilæ W.	74 11 15	9199	75 37 34	9183	77 4 4	9176	78 30 42	9171
	JUPITER W.	63 38 21	9304	65 24 14	9307	67 10 3	9310	68 55 48	9312
	Fomalhaut W.	39 12 54	9800	40 47 22	9775	42 22 23	9753	43 57 52	9734
	Aldebaran E.	58 55 22	9399	57 11 21	9367	55 27 28	9393	53 43 42	9399
	Pollux E.	103 3 49	9366	101 19 29	9373	99 35 15	9378	97 51 8	9363

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	SUN W.	30 43 24	9896	32 20' 9"	9890	33 57' 3"	9894	35 34' 5"	9878
	JUPITER E.	43 32 17	9309	41 46 20	9298	40 0 18	9296	38 14 11	9294
	Fomalhaut E.	70 10 25	9557	68 30 31	9556	66 50 36	9556	65 10 41	9557
	α Pegasi E.	88 59 4	9775	87 24 3	9770	85 48 56	9766	84 13 44	9764
15	SUN W.	43 41 15	9852	45 19 0	9848	46 56 52	9844	48 34 48	9840
	JUPITER E.	29 23 6	9290	27 36 54	9289	25 50 42	9294	24 4 34	9296
	Fomalhaut E.	56 51 51	9577	55 12 25	9584	53 33 8	9593	51 54 4	9604
	α Pegasi E.	76 17 25	9768	74 42 15	9779	73 7 10	9778	71 32 13	9784
16	SUN W.	56 45 34	9896	58 23 53	9894	60 2 15	9893	61 40 39	9891
	VENUS W.	31 48 56	9299	33 35 8	9285	35 21 30	9279	37 8 0	9274
	Fomalhaut E.	43 43 16	9690	42 6 23	9714	40 30 4	9744	38 54 23	9760
	α Pegasi E.	63 40 10	9839	62 6 32	9855	60 33 16	9873	59 0 23	9894
	α Arietis E.	105 7 27	9496	103 24 29	9499	101 41 27	9419	99 58 20	9417
17	SUN W.	69 53 8	9816	71 31 41	9815	73 10 15	9815	74 48 49	9815
	VENUS W.	46 2 15	9263	47 49 23	9260	49 36 35	9248	51 23 51	9245
	Fomalhaut E.	31 9 50	3056	29 40 46	3143	28 13 29	3247	26 48 15	3379
	α Pegasi E.	51 23 36	3039	49 54 11	3078	48 25 35	3192	46 57 52	3173
	α Arietis E.	91 22 2	9410	89 38 41	9411	87 55 21	9410	86 12 0	9410
18	SUN W.	83 1 36	9617	84 40 8	9618	86 18 36	9619	87 57 8	9620
	VENUS W.	60 21 3	9296	62 8 38	9294	63 56 14	9293	65 43 52	9293
	α Arietis E.	77 35 37	9418	75 52 28	9491	74 9 23	9494	72 26 22	9496
	Aldebaran E.	107 59 25	9311	106 13 42	9319	104 28 1	9313	102 42 20	9314
19	SUN W.	96 9 12	9696	97 47 32	9698	99 25 48	9630	101 4 2	9639
	VENUS W.	74 42 22	9299	76 30 7	9299	78 17 52	9299	80 5 37	9299
	JUPITER E.	28 13 5	9266	29 59 23	9265	31 45 45	9264	33 32 8	9263
	α Arietis E.	63 52 46	9459	62 10 25	9458	60 28 13	9465	58 46 11	9473
	Aldebaran E.	93 54 17	9390	92 8 46	9291	90 23 17	9292	88 37 51	9294
20	SUN W.	109 14 30	9644	110 52 25	9647	112 30 17	9650	114 8 5	9650
	VENUS W.	89 4 17	9290	90 51 59	9291	92 39 40	9292	94 27 19	9293
	α Aquilæ W.	57 23 22	3471	58 44 18	3431	60 5 59	3395	61 28 21	3363
	JUPITER W.	42 24 9	9284	44 10 31	9285	45 56 53	9287	47 43 12	9286
	α Arietis E.	50 19 10	9596	48 38 33	9540	46 58 15	9556	45 18 19	9579
	Aldebaran E.	79 51 24	9296	78 6 17	9239	76 21 14	9242	74 36 15	9245
21	SUN W.	122 16 0	9670	123 53 20	9674	125 30 35	9678	127 7 45	9683
	VENUS W.	103 25 5	9242	105 12 31	9244	106 59 53	9246	108 47 12	9248
	α Aquilæ W.	68 28 21	3244	69 53 38	3296	71 19 14	3214	72 45 7	3201
	JUPITER W.	56 34 17	9296	58 20 23	9296	60 6 25	9290	61 52 25	9298
	α Arietis E.	37 5 31	9695	35 28 45	9731	33 52 46	9769	32 17 38	9816
	Aldebaran E.	65 52 35	9263	64 8 7	9267	62 23 45	9272	60 39 30	9277
22	α Aquilæ W.	79 57 27	3166	81 24 15	3165	82 51 6	3164	84 17 58	3166
	JUPITER W.	70 41 30	9214	72 27 9	9217	74 12 43	9230	75 58 14	9232
	Fomalhaut W.	45 33 47	9719	47 10 2	9706	48 46 36	9693	50 23 25	9684
	Aldebaran E.	52 0 5	9405	50 16 37	9419	48 33 18	9419	46 50 9	9416
	Pollux E.	96 7 7	9267	94 23 14	9299	92 39 28	9297	90 55 49	9403

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Dif.	III ^h .	P. L. of Dif.	VI ^h .	P. L. of Dif.	IX ^h .	P. L. of Dif.
23	α Aquilæ W.	85 44 48	3168	87 11 36	3172	88 38 19	3176	90 4 55	3183
	JUPITER W.	77 43 41	3236	79 29 3	3239	81 14 21	3239	82 59 34	3234
	Fomalhaut W.	52 0 26	3677	53 37 36	3671	55 14 54	3686	56 52 20	3689
	α Pegasi W.	38 32 53	3640	39 50 44	3559	41 10 3	3489	42 30 41	3486
	Aldebaran E.	45 7 10	3433	43 24 22	3449	41 41 46	3451	39 59 22	3460
	Pollux E.	89 12 19	3468	87 28 56	3415	85 45 42	3492	84 2 38	3498
24	JUPITER W.	91 44 41	3248	93 29 30	3251	95 14 16	3254	96 58 57	3256
	Fomalhaut W.	65 0 5	3689	66 37 36	3664	68 15 3	3668	69 52 26	3672
	α Pegasi W.	49 28 53	3212	50 54 47	3184	52 21 16	3160	53 48 13	3138
	Pollux E.	75 29 39	3463	73 47 34	3471	72 5 41	3480	70 23 59	3488
	Regulus E.	111 33 57	3471	109 52 3	3478	108 10 20	3486	106 28 47	3494
25	Fomalhaut W.	77 57 44	3709	79 34 21	3710	81 10 49	3717	82 47 6	3736
	α Pegasi W.	61 8 16	3073	62 36 59	3085	64 5 51	3080	65 34 49	3057
	Pollux E.	61 58 35	3534	60 18 9	3544	58 37 57	3554	56 57 59	3564
	Regulus E.	98 3 57	3538	96 23 36	3547	94 43 29	3557	93 3 34	3567
	SATURN E.	116 2 33	3552	114 22 31	3561	112 42 42	3570	111 3 6	3591
26	Fomalhaut W.	90 45 28	3776	92 20 27	3787	93 55 12	3799	95 29 41	3812
	α Pegasi W.	73 0 12	3059	74 29 12	3063	75 58 7	3067	77 26 57	3073
	α Arietis W.	29 23 25	3110	30 51 23	3075	32 20 3	3047	33 49 18	3094
	Pollux E.	48 41 47	3690	47 3 19	3631	45 25 6	3643	43 47 10	3655
	Regulus E.	84 47 31	3690	83 9 3	3631	81 30 48	3648	79 52 50	3653
	SATURN E.	102 48 32	3632	101 10 20	3643	99 32 22	3654	97 54 39	3685
27	Fomalhaut W.	103 18 0	3878	104 50 47	3893	106 23 16	3908	107 55 25	3924
	α Pegasi W.	84 49 1	3114	86 16 54	3194	87 44 35	3134	89 12 3	3146
	α Arietis W.	41 21 2	3064	42 51 59	3060	44 23 2	3058	45 54 7	3058
	Pollux E.	35 41 43	3790	34 5 30	3734	32 29 36	3748	30 54 0	3763
	Regulus E.	71 46 49	3712	70 10 25	3734	68 34 17	3736	66 58 24	3748
	SATURN E.	89 49 53	3792	88 13 42	3733	86 37 47	3745	85 2 7	3757
28	α Pegasi W.	96 25 40	3213	97 51 34	3226	99 17 10	3243	100 42 28	3259
	α Arietis W.	53 29 17	3070	55 0 7	3075	56 30 51	3080	58 1 27	3086
	Aldebaran W.	22 2 29	3606	23 34 53	3606	25 7 18	3598	26 39 39	3601
	Regulus E.	59 3 7	3610	57 28 52	3622	55 54 53	3635	54 21 11	3648
	SATURN E.	77 7 44	3617	75 33 38	3626	73 59 47	3640	72 26 12	3652
	Spica E.	113 5 6	3621	111 31 5	3632	109 57 18	3643	108 23 46	3654
29	α Arietis W.	65 32 28	3022	67 2 14	3029	68 31 49	3037	70 1 15	3045
	Aldebaran W.	34 20 2	3630	35 51 43	3638	37 23 14	3645	38 54 36	3654
	Regulus E.	46 36 40	3609	45 4 32	3591	43 32 40	3623	42 1 5	3646
	SATURN E.	64 42 0	3610	63 9 54	3620	61 38 1	3631	60 6 23	3642
	Spica E.	100 39 38	3609	99 7 30	3620	97 35 36	3630	96 3 55	3640
30	α Arietis W.	77 25 58	3085	78 54 26	3093	80 22 44	3101	81 50 53	3109
	Aldebaran W.	46 28 55	3693	47 59 16	3690	49 29 29	3698	50 59 32	3695
	Regulus E.	34 27 5	3609	32 57 4	3622	31 27 20	3635	29 57 51	3649
	SATURN E.	52 31 29	3623	51 1 8	3623	49 30 59	3612	48 1 1	3621
	Spica E.	88 28 42	3609	86 58 15	3606	85 28 0	3607	83 57 56	3616
	SUN E.	134 13 24	3341	132 50 0	3351	131 26 48	3361	130 3 47	3370

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	α Aquilæ	W. 91° 31' 25"	3191	92° 57' 45"	3301	94° 23' 53"	3311	95° 49' 49"	3323
	JUPITER	W. 84 44 44	3337	86 29 50	3341	88 14 51	3343	89 59 48	3346
	Fomalhaut	W. 58 29 51	3360	60 7 23	3359	61 44 58	3360	63 22 32	3360
	α Pegasi	W. 43 52 28	3379	45 15 18	3394	46 39 2	3391	48 3 36	3344
	Aldebaran	E. 38 17 11	3469	36 35 14	3479	34 53 31	3490	33 12 4	3509
	Pollux	E. 82 19 42	3434	80 36 56	3441	78 54 20	3448	77 11 54	3456
24	JUPITER	W. 98 43 35	3358	100 28 10	3360	102 12 42	3369	103 57 12	3363
	Fomalhaut	W. 71 29 44	3376	73 6 55	3381	74 44 0	3388	76 20 56	3394
	α Pegasi	W. 55 15 36	3190	56 43 21	3105	58 11 24	3099	59 39 43	3081
	Pollux	E. 68 42 30	3498	67 1 11	3505	65 20 6	3515	63 39 13	3535
	Regulus	E. 104 47 25	3509	103 6 15	3511	101 25 17	3500	99 44 30	3509
25	Fomalhaut	W. 84 23 12	3735	85 59 5	3744	87 34 46	3754	89 10 14	3765
	α Pegasi	W. 67 3 51	3055	68 32 56	3053	70 2 3	3054	71 31 8	3056
	Pollux	E. 55 18 14	3575	53 38 45	3586	51 59 30	3597	50 20 31	3608
	Regulus	E. 91 23 53	3577	89 44 26	3587	88 5 13	3598	86 26 14	3609
	SATURN	E. 109 23 44	3580	107 44 35	3600	106 5 40	3610	104 26 59	3621
26	Fomalhaut	W. 97 3 54	3694	98 37 51	3637	100 11 31	3650	101 44 54	3664
	α Pegasi	W. 78 55 40	3080	80 24 14	3087	81 52 40	3095	83 20 56	3104
	α Arietis	W. 35 19 1	3005	36 49 8	3090	38 19 33	3078	39 50 13	3070
	Pollux	E. 42 9 31	3668	40 32 8	3681	38 55 2	3694	37 18 14	3707
	Regulus	E. 78 15 6	3665	76 37 39	3676	75 0 26	3688	73 23 30	3700
	SATURN	E. 96 17 11	3676	94 39 59	3687	93 3 2	3698	91 26 20	3710
27	Fomalhaut	W. 109 27 16	3939	110 58 46	3954	112 29 56	3971	114 0 45	3987
	α Pegasi	W. 90 39 17	3158	92 6 16	3171	93 33 0	3184	94 59 28	3198
	α Arietis	W. 47 25 13	3058	48 56 18	3059	50 27 22	3061	51 58 22	3066
	Pollux	E. 29 18 45	3779	27 43 49	3795	26 9 14	3811	24 35 0	3828
	Regulus	E. 65 22 48	3781	63 47 29	3773	62 12 25	3785	60 37 38	3797
	SATURN	E. 83 26 43	3769	81 51 35	3781	80 16 42	3793	78 42 5	3805
28	α Pegasi	W. 102 7 27	3377	103 32 7	3394	104 56 26	3319	106 20 25	3330
	α Arietis	W. 59 31 57	3093	61 2 18	3090	62 32 30	3097	64 2 34	3014
	Aldebaran	W. 28 11 56	3905	29 44 8	3910	31 16 14	3916	32 48 12	3933
	Regulus	E. 52 47 44	3661	51 14 35	3673	49 41 40	3685	48 9 2	3697
	SATURN	E. 70 52 52	3664	69 19 47	3675	67 46 56	3686	66 14 21	3696
	Spica	E. 106 50 28	3665	105 17 24	3676	103 44 35	3687	102 11 59	3696
29	α Arietis	W. 71 30 31	3053	72 59 38	3061	74 28 34	3069	75 57 21	3077
	Aldebaran	W. 40 25 47	3961	41 56 49	3969	43 27 41	3977	44 58 23	3985
	Regulus	E. 40 29 46	3959	38 58 42	3971	37 27 54	3983	35 57 22	3996
	SATURN	E. 58 34 58	3953	57 3 46	3963	55 32 48	3973	54 2 2	3983
	Spica	E. 94 32 27	3950	93 1 12	3960	91 30 10	3970	89 59 20	3980
30	α Arietis	W. 83 18 52	3116	84 46 42	3123	86 14 24	3130	87 41 57	3137
	Aldebaran	W. 52 29 26	3099	53 59 11	3098	55 28 48	3035	56 58 17	3041
	Regulus	E. 28 28 39	3065	26 59 46	3079	25 31 11	3094	24 2 54	3110
	SATURN	E. 46 31 15	3030	45 1 40	3039	43 32 15	3047	42 3 1	3055
	Spica	E. 82 28 3	3094	80 58 20	3039	79 28 47	3040	77 59 23	3047
	SUN	E. 128 40 56	3379	127 18 15	3387	125 55 44	3395	124 33 22	3403

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.											
Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Added to Apparent Time.				
Mon.	1	^h 16 ^m 30 ^s 22.27	^s 10.802	S. 21° 51' 20.4"	["] -23.07	16' 15.99"	^s 70.32	^m 10 ^s 46.58	^s 0.944		
Tues.	2	16 34 41.86	10.830	22 0 21.8	22.02	16 16.13	70.40	10 23.61	0.971		
Wed.	3	16 39 2.09	10.856	22 8 57.8	20.96	16 16.27	70.48	10 0.00	0.997		
Thur.	4	16 43 22.94	10.881	22 17 8.1	-19.89	16 16.40	70.56	9 35.77	1.022		
Frid.	5	16 47 44.38	10.905	22 24 52.5	18.80	16 16.53	70.64	9 10.96	1.046		
Sat.	6	16 52 6.38	10.928	22 32 10.8	17.71	16 16.66	70.71	8 45.58	1.069		
SUN.	7	16 56 28.93	10.949	22 39 2.7	-16.60	16 16.78	70.78	8 19.66	1.090		
Mon.	8	17 0 51.99	10.970	22 45 28.0	15.49	16 16.90	70.84	7 53.23	1.111		
Tues.	9	17 5 15.53	10.989	22 51 26.5	14.37	16 17.01	70.90	7 26.33	1.130		
Wed.	10	17 9 39.51	11.007	22 56 57.9	-13.24	16 17.12	70.96	6 58.99	1.148		
Thur.	11	17 14 3.90	11.023	23 2 2.0	12.10	16 17.23	71.01	6 31.24	1.164		
Frid.	12	17 18 28.66	11.038	23 6 38.7	10.95	16 17.33	71.06	6 3.11	1.179		
Sat.	13	17 22 53.76	11.051	23 10 47.8	- 9.80	16 17.43	71.11	5 34.63	1.192		
SUN.	14	17 27 19.17	11.064	23 14 29.2	8.65	16 17.53	71.15	5 5.85	1.205		
Mon.	15	17 31 44.86	11.074	23 17 42.7	7.49	16 17.62	71.18	4 36.81	1.215		
Tues.	16	17 36 10.78	11.083	23 20 28.2	- 6.32	16 17.71	71.21	4 7.53	1.224		
Wed.	17	17 40 36.89	11.091	23 22 45.6	5.14	16 17.80	71.24	3 38.06	1.231		
Thur.	18	17 45 3.16	11.098	23 24 34.9	3.96	16 17.88	71.26	3 8.43	1.238		
Frid.	19	17 49 29.55	11.102	23 25 55.9	- 2.78	16 17.96	71.28	2 38.67	1.242		
Sat.	20	17 53 56.04	11.105	23 26 48.6	1.60	16 18.03	71.29	2 8.82	1.245		
SUN.	21	17 58 22.58	11.106	23 27 13.0	- 0.42	16 18.09	71.30	1 38.92	1.246		
Mon.	22	18 2 49.15	11.107	23 27 9.1	+ 0.75	16 18.15	71.30	1 9.00	1.247		
Tues.	23	18 7 15.69	11.106	23 26 36.9	1.93	16 18.20	71.30	0 39.10	1.246		
Wed.	24	18 11 42.20	11.104	23 25 36.4	3.11	16 18.25	71.29	0 9.23	1.244		
Thur.	25	18 16 8.66	11.100	23 24 7.6	+ 4.29	16 18.29	71.28	0 20.59	1.240		
Frid.	26	18 20 35.02	11.096	23 22 10.6	5.46	16 18.33	71.27	0 50.32	1.236		
Sat.	27	18 25 1.24	11.090	23 19 45.4	6.63	16 18.36	71.25	1 19.91	1.230		
SUN.	28	18 29 27.30	11.083	23 16 52.1	+ 7.80	16 18.38	71.23	1 49.33	1.223		
Mon.	29	18 33 53.18	11.074	23 13 30.8	8.97	16 18.40	71.20	2 18.56	1.214		
Tues.	30	18 38 18.84	11.064	23 9 41.7	10.13	16 18.41	71.17	2 47.58	1.204		
Wed.	31	18 42 44.25	11.053	23 5 24.8	11.29	16 18.41	71.13	3 16.36	1.193		
Thur.	32	18 47 9.38	11.041	S. 23 0 40.2	+12.44	16 18.41	71.09	3 44.85	1.181		

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sideral time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing;
the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
Mon.	1	h m s 16 30 24.21	s 10.800	S. 21° 51' 24.6"	-23.06	m s 10 46.41	s 0.944	h m s 16 41 10.62	
Tues.	2	16 34 43.74	10.837	22 0 25.6	22.01	10 23.44	0.971	16 45 7.18	
Wed.	3	16 39 3.90	10.853	22 9 1.3	20.95	9 59.83	0.997	16 49 3.73	
Thur.	4	16 43 24.68	10.878	22 17 11.3	-19.88	9 35.61	1.022	16 53 0.29	
Frid.	5	16 47 46.05	10.902	22 24 55.4	18.79	9 10.80	1.046	16 56 56.84	
Sat.	6	16 52 7.98	10.925	22 32 13.4	17.70	8 45.43	1.069	17 0 53.41	
SUN.	7	16 56 30.45	10.946	22 39 5.1	-16.50	8 19.51	1.090	17 4 49.96	
Mon.	8	17 0 53.43	10.967	22 45 30.1	15.48	7 53.09	1.111	17 8 46.52	
Tues.	9	17 5 16.89	10.986	22 51 28.3	14.36	7 26.19	1.130	17 12 43.08	
Wed.	10	17 9 40.79	11.004	22 56 59.5	-13.23	6 58.85	1.148	17 16 39.64	
Thur.	11	17 14 5.09	11.020	23 2 3.4	12.09	6 31.11	1.164	17 20 36.20	
Frid.	12	17 18 29.77	11.035	23 6 39.9	10.94	6 2.99	1.179	17 24 32.76	
Sat.	13	17 22 54.79	11.048	23 10 48.8	- 9.79	5 34.52	1.192	17 28 29.31	
SUN.	14	17 27 20.12	11.061	23 14 30.0	8.64	5 5.75	1.205	17 32 25.87	
Mon.	15	17 31 45.71	11.071	23 17 43.3	7.48	4 36.72	1.215	17 36 22.43	
Tues.	16	17 36 11.54	11.080	23 20 28.7	- 6.31	4 7.45	1.224	17 40 18.99	
Wed.	17	17 40 37.56	11.087	23 22 46.0	5.14	3 37.99	1.231	17 44 15.55	
Thur.	18	17 45 3.74	11.094	23 24 35.1	3.96	3 8.37	1.238	17 48 12.11	
Frid.	19	17 49 30.04	11.098	23 25 56.0	- 2.78	2 38.62	1.242	17 52 8.66	
Sat.	20	17 53 56.44	11.101	23 26 48.7	1.60	2 8.78	1.245	17 56 5.22	
SUN.	21	17 58 22.89	11.102	23 27 13.1	- 0.42	1 38.89	1.246	18 0 1.78	
Mon.	22	18 2 49.36	11.103	23 27 9.1	+ 0.75	1 8.98	1.247	18 3 58.34	
Tues.	23	18 7 15.81	11.102	23 26 36.9	1.93	0 39.09	1.246	18 7 54.90	
Wed.	24	18 11 42.23	11.100	23 25 36.4	3.11	0 9.23	1.244	18 11 51.46	
Thur.	25	18 16 8.60	11.096	23 24 7.6	+ 4.29	0 20.58	1.240	18 15 48.01	
Frid.	26	18 20 34.87	11.092	23 22 10.7	5.46	0 50.30	1.236	18 19 44.57	
Sat.	27	18 25 1.00	11.086	23 19 45.6	6.63	1 19.87	1.230	18 23 41.13	
SUN.	28	18 29 26.97	11.079	23 16 52.4	+ 7.80	1 49.28	1.223	18 27 37.69	
Mon.	29	18 33 52.76	11.070	23 13 31.3	8.97	2 18.51	1.214	18 31 34.25	
Tues.	30	18 38 18.33	11.060	23 9 42.2	10.13	2 47.52	1.204	18 35 30.81	
Wed.	31	18 42 43.65	11.049	23 5 25.4	11.28	3 16.29	1.193	18 39 27.36	
Thur.	32	18 47 8.69	11.037	S. 23 0 40.9	+12.43	3 44.77	1.181	18 43 23.92	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 hour,
 + 9".8565.
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ'					
1	335	249° 17' 38.9	17° 10.3	152.11	+ 0.31	9.9937303	-27.0	^h 7 ^m 17 ^s 37.49
2	336	250 18 30.4	18 1.6	152.17	0.38	9.9936667	26.1	7 13 41.58
3	337	251 19 23.2	18 54.2	152.23	0.43	9.9936052	25.2	7 9 45.67
4	338	252 20 17.4	19 48.2	152.29	+ 0.45	9.9935457	-24.4	7 5 49.76
5	339	253 21 13.0	20 43.6	152.34	0.43	9.9934882	23.6	7 1 53.84
6	340	254 22 9.8	21 40.3	152.40	0.38	9.9934325	22.8	6 57 57.93
7	341	255 23 7.9	22 38.2	152.45	+ 0.31	9.9933786	-22.1	6 54 2.02
8	342	256 24 7.2	23 37.3	152.50	0.22	9.9933263	21.5	6 50 6.11
9	343	257 25 7.6	24 37.5	152.54	+ 0.10	9.9932756	20.8	6 46 10.19
10	344	258 26 9.0	25 38.7	152.58	- 0.03	9.9932265	-20.2	6 42 14.28
11	345	259 27 11.3	26 40.8	152.62	0.16	9.9931789	19.6	6 38 18.37
12	346	260 28 14.4	27 43.8	152.65	0.29	9.9931326	19.0	6 34 22.46
13	347	261 29 18.2	28 47.4	152.67	- 0.41	9.9930878	-18.4	6 30 26.54
14	348	262 30 22.6	29 51.6	152.69	0.52	9.9930446	17.7	6 26 30.63
15	349	263 31 27.6	30 56.4	152.71	0.60	9.9930031	16.9	6 22 34.72
16	350	264 32 33.0	32 1.7	152.73	- 0.66	9.9929633	-16.1	6 18 38.81
17	351	265 33 38.8	33 7.3	152.74	0.69	9.9929254	15.3	6 14 42.89
18	352	266 34 44.9	34 13.2	152.75	0.69	9.9928894	14.5	6 10 46.98
19	353	267 35 51.2	35 19.3	152.76	- 0.66	9.9928555	-13.6	6 6 51.07
20	354	268 36 57.7	36 25.6	152.77	0.60	9.9928238	12.7	6 2 55.16
21	355	269 38 4.5	37 32.2	152.78	0.51	9.9927944	11.7	5 58 59.24
22	356	270 39 11.4	38 38.9	152.79	- 0.39	9.9927675	-10.7	5 55 3.33
23	357	271 40 18.4	39 45.7	152.80	0.26	9.9927433	9.6	5 51 7.42
24	358	272 41 25.5	40 52.7	152.81	- 0.13	9.9927219	8.4	5 47 11.51
25	359	273 42 33.0	41 59.9	152.82	0.00	9.9927032	- 7.3	5 43 15.59
26	360	274 43 40.7	43 7.4	152.83	+ 0.14	9.9926873	6.1	5 39 19.68
27	361	275 44 48.6	44 15.1	152.84	0.26	9.9926742	4.9	5 35 23.77
28	362	276 45 56.7	45 23.0	152.85	+ 0.36	9.9926639	- 3.7	5 31 27.86
29	363	277 47 5.1	46 31.2	152.86	0.44	9.9926568	2.5	5 27 31.94
30	364	278 48 13.8	47 39.8	152.87	0.49	9.9926522	1.4	5 23 36.03
31	365	279 49 22.9	48 48.7	152.88	0.51	9.9926502	- 0.3	5 19 40.12
32	366	280 50 32.3	49 57.9	152.90	+ 0.49	9.9926508	+ 0.8	5 15 44.21
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0.								Diff. for 1 Hour, — 9 ^m .8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI-DIAMETER.

HORIZONTAL PARALLAX.

UPPER TRANSIT.

AGE.

Noon.

Midnight.

Noon.

Diff. for
1 Hour.

Midnight.

Diff. for
1 Hour.Meridian of
Greenwich.Diff. for
1 Hour.

Noon.

1	14 52.0	14 50.0	54 26.9	-0.71	54 19.5	-0.52	16 28.4	1.95	18.9
2	14 48.6	14 47.9	54 14.5	-0.32	54 11.9	-0.11	17 13.9	1.85	19.9
3	14 47.9	14 48.6	54 11.8	+0.11	54 14.4	+0.33	17 57.3	1.77	20.9
4	14 50.0	14 52.2	54 19.7	+0.55	54 27.5	+0.77	18 39.1	1.73	21.9
5	14 55.0	14 58.6	54 38.0	0.99	54 51.0	1.19	19 20.5	1.73	22.9
6	15 2.7	15 7.5	55 6.3	1.38	55 23.9	1.55	20 2.3	1.77	23.9
7	15 12.8	15 18.6	55 43.4	+1.70	56 4.6	+1.82	20 45.7	1.87	24.9
8	15 24.7	15 31.1	56 27.0	1.91	56 50.4	1.97	21 31.9	2.00	25.9
9	15 37.6	15 44.1	57 14.3	1.99	57 38.2	1.97	22 21.9	2.18	26.9
10	15 50.4	15 56.5	58 1.5	+1.91	58 23.8	+1.80	23 16.5	2.36	27.9
11	16 2.2	16 7.3	58 44.6	1.66	59 3.5	1.48	0		28.9
12	16 11.8	16 15.6	59 20.0	1.27	59 33.8	1.03	0 15.5	2.52	0.4
13	16 18.5	16 20.6	59 44.7	+0.78	59 52.4	+0.52	1 17.5	2.60	1.4
14	16 21.9	16 22.3	59 57.1	+0.27	59 58.7	+0.02	2 20.2	2.57	2.4
15	16 22.0	16 20.9	59 57.4	-0.23	59 53.4	-0.44	3 21.1	2.46	3.4
16	16 19.1	16 16.9	59 47.0	-0.62	59 38.6	-0.78	4 18.5	2.31	4.4
17	16 14.1	16 10.9	59 28.4	0.91	59 16.8	1.01	5 12.1	2.16	5.4
18	16 7.5	16 3.8	59 4.2	1.09	58 50.8	1.15	6 2.4	2.05	6.4
19	16 0.0	15 56.1	58 36.7	-1.19	58 22.3	-1.21	6 50.4	1.98	7.4
20	15 52.1	15 48.2	58 7.7	1.23	57 52.9	1.24	7 37.5	1.97	8.4
21	15 44.1	15 40.0	57 38.1	1.24	57 23.3	1.24	8 24.9	1.99	9.4
22	15 36.0	15 32.0	57 8.5	-1.23	56 53.8	-1.22	9 13.3	2.05	10.4
23	15 28.0	15 24.1	56 39.2	1.21	56 24.7	1.21	10 3.3	2.12	11.4
24	15 20.1	15 16.3	56 10.2	1.20	55 56.0	1.18	10 55.1	2.18	12.4
25	15 12.5	15 8.8	55 42.1	-1.16	55 28.5	-1.12	11 47.9	2.20	13.4
26	15 5.2	15 1.8	55 15.4	1.07	55 2.9	1.01	12 40.7	2.17	14.4
27	14 58.6	14 55.6	54 51.1	0.94	54 40.2	0.86	13 32.2	2.10	15.4
28	14 53.0	14 50.7	54 30.5	-0.76	54 22.1	-0.65	14 21.5	2.00	16.4
29	14 48.8	14 47.4	54 15.1	0.52	54 9.9	0.37	15 8.2	1.89	17.4
30	14 46.4	14 46.0	54 6.4	-0.21	54 5.0	-0.03	15 52.3	1.80	18.4
31	14 46.2	14 47.0	54 5.7	+0.16	54 8.7	+0.36	16 34.5	1.73	19.4
32	14 48.5	14 50.7	54 14.2	+0.57	54 22.2	+0.78	17 15.4	1.70	20.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	^h 8 ^m 37 ^s 57.49	2.1199	N. 22° 46' 52.9"	5.911	0	^h 10 ^m 15 ^s 2.65	1.9399	N. 16° 19' 44.3"	9.933
1	8 40 4.56	2.1158	22 40 55.2	6.012	1	10 16 58.53	1.9998	16 9 46.3	9.998
2	8 42 11.39	2.1117	22 34 51.4	6.113	2	10 18 54.22	1.9966	15 59 44.5	10.063
3	8 44 17.97	2.1076	22 28 41.6	6.213	3	10 20 49.72	1.9935	15 49 38.8	10.128
4	8 46 24.30	2.1034	22 22 25.8	6.313	4	10 22 45.04	1.9904	15 39 29.2	10.192
5	8 48 30.38	2.0991	22 16 4.0	6.412	5	10 24 40.17	1.9173	15 29 15.8	10.255
6	8 50 36.20	2.0949	22 9 36.3	6.510	6	10 26 35.12	1.9144	15 18 58.6	10.317
7	8 52 41.77	2.0908	22 3 2.8	6.607	7	10 28 29.90	1.9115	15 8 37.7	10.379
8	8 54 47.10	2.0866	21 56 23.5	6.702	8	10 30 24.50	1.9086	14 58 13.1	10.440
9	8 56 52.17	2.0824	21 49 38.5	6.797	9	10 32 18.93	1.9057	14 47 44.9	10.501
10	8 58 56.99	2.0782	21 42 47.8	6.892	10	10 34 13.19	1.9030	14 37 13.0	10.562
11	9 1 1.56	2.0740	21 35 51.4	6.986	11	10 36 7.29	1.9003	14 26 37.5	10.620
12	9 3 5.87	2.0698	21 28 49.4	7.079	12	10 38 1.23	1.8977	14 15 58.6	10.678
13	9 5 9.93	2.0657	21 21 41.9	7.172	13	10 39 55.01	1.8950	14 5 16.2	10.736
14	9 7 13.75	2.0616	21 14 28.8	7.264	14	10 41 48.63	1.8923	13 54 30.3	10.794
15	9 9 17.32	2.0574	21 7 10.2	7.355	15	10 43 42.09	1.8897	13 43 40.9	10.851
16	9 11 20.64	2.0533	20 59 46.2	7.444	16	10 45 35.40	1.8873	13 32 48.2	10.906
17	9 13 23.71	2.0492	20 52 16.9	7.533	17	10 47 28.57	1.8850	13 21 52.2	10.961
18	9 15 26.54	2.0451	20 44 42.2	7.622	18	10 49 21.60	1.8827	13 10 52.9	11.015
19	9 17 29.12	2.0409	20 37 2.2	7.710	19	10 51 14.49	1.8803	12 59 50.4	11.069
20	9 19 31.45	2.0368	20 29 17.0	7.797	20	10 53 7.24	1.8780	12 48 44.6	11.123
21	9 21 33.54	2.0326	20 21 26.5	7.884	21	10 54 59.85	1.8758	12 37 35.6	11.176
22	9 23 35.39	2.0287	20 13 30.9	7.969	22	10 56 52.33	1.8737	12 26 23.5	11.228
23	9 25 36.99	2.0247	N. 20° 5' 30.2"	8.053	23	10 58 44.69	1.8716	N. 12° 15' 8.3"	11.280
TUESDAY 2.					THURSDAY 4.				
0	9 27 38.35	2.0207	N. 19° 57' 24.5"	8.137	0	11 0 36.92	1.8695	N. 12° 3' 49.9"	11.339
1	9 29 39.47	2.0167	19 49 13.8	8.230	1	11 2 29.03	1.8676	11 52 28.5	11.381
2	9 31 40.35	2.0127	19 40 58.1	8.303	2	11 4 21.03	1.8657	11 41 4.2	11.430
3	9 33 40.99	2.0087	19 32 37.4	8.386	3	11 6 12.91	1.8638	11 29 36.9	11.479
4	9 35 41.40	2.0048	19 24 11.8	8.467	4	11 8 4.68	1.8619	11 18 6.7	11.527
5	9 37 41.57	2.0009	19 15 41.4	8.546	5	11 9 56.34	1.8602	11 6 33.6	11.575
6	9 39 41.51	1.9970	19 7 6.3	8.625	6	11 11 47.90	1.8585	10 54 57.7	11.622
7	9 41 41.21	1.9932	18 58 26.4	8.704	7	11 13 39.36	1.8568	10 43 19.0	11.669
8	9 43 40.69	1.9894	18 49 41.8	8.782	8	11 15 30.72	1.8552	10 31 37.5	11.715
9	9 45 39.94	1.9856	18 40 52.6	8.859	9	11 17 21.99	1.8537	10 19 53.2	11.761
10	9 47 38.96	1.9818	18 31 58.8	8.936	10	11 19 13.17	1.8523	10 8 6.2	11.805
11	9 49 37.76	1.9781	18 23 0.2	9.012	11	11 21 4.27	1.8509	9 56 16.6	11.848
12	9 51 36.34	1.9744	18 13 57.3	9.087	12	11 22 55.28	1.8496	9 44 24.4	11.892
13	9 53 34.69	1.9708	18 4 49.9	9.161	13	11 24 46.22	1.8483	9 32 29.6	11.935
14	9 55 32.83	1.9673	17 55 38.0	9.235	14	11 26 37.08	1.8471	9 20 32.2	11.977
15	9 57 30.75	1.9636	17 46 21.7	9.308	15	11 28 27.87	1.8459	9 8 32.3	12.018
16	9 59 28.46	1.9600	17 37 1.0	9.380	16	11 30 18.59	1.8448	8 56 30.0	12.059
17	10 1 25.95	1.9564	17 27 36.1	9.451	17	11 32 9.25	1.8438	8 44 25.2	12.100
18	10 3 23.23	1.9529	17 18 6.9	9.522	18	11 33 59.85	1.8428	8 32 18.0	12.139
19	10 5 20.30	1.9495	17 8 33.5	9.592	19	11 35 50.39	1.8419	8 20 8.5	12.178
20	10 7 17.17	1.9462	16 58 55.9	9.662	20	11 37 40.88	1.8419	8 7 56.6	12.217
21	10 9 13.84	1.9428	16 49 14.1	9.731	21	11 39 31.33	1.8405	7 55 42.4	12.256
22	10 11 10.31	1.9395	16 39 28.2	9.799	22	11 41 21.74	1.8397	7 43 25.9	12.293
23	10 13 6.58	1.9362	16 29 38.3	9.866	23	11 43 12.10	1.8390	7 31 7.2	12.329
24	10 15 2.65	1.9329	N. 16° 19' 44.3"	9.933	24	11 45 2.42	1.8384	N. 7° 18' 46.4"	12.365

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	11 45 2.42	1.8384	N. 7 18' 46.4"	19.365	0	13 13 55.63	1.8994	S. 3 3' 58.7"	13.316
1	11 46 52.71	1.8380	7 6 23.4	19.401	1	13 15 49.26	1.8953	3 17 17.7	13.317
2	11 48 42.98	1.8376	6 53 58.3	19.435	2	13 17 43.07	1.8913	3 30 36.8	13.318
3	11 50 33.22	1.8373	6 41 31.2	19.469	3	13 19 37.06	1.9014	3 43 55.9	13.318
4	11 52 23.44	1.8368	6 29 2.1	19.503	4	13 21 31.24	1.9045	3 57 15.0	13.317
5	11 54 13.64	1.8366	6 16 30.9	19.537	5	13 23 25.60	1.9076	4 10 34.0	13.316
6	11 56 3.83	1.8364	6 3 57.7	19.569	6	13 25 20.15	1.9108	4 23 52.9	13.313
7	11 57 54.01	1.8363	5 51 22.6	19.600	7	13 27 14.90	1.9142	4 37 11.6	13.309
8	11 59 44.19	1.8369	5 38 45.7	19.631	8	13 29 9.86	1.9177	4 50 30.0	13.304
9	12 1 34.36	1.8369	5 26 6.9	19.662	9	13 31 5.03	1.9212	5 3 48.1	13.299
10	12 3 24.54	1.8364	5 13 26.3	19.691	10	13 33 0.41	1.9248	5 17 5.9	13.293
11	12 5 14.73	1.8366	5 0 44.0	19.720	11	13 34 56.01	1.9284	5 30 23.3	13.286
12	12 7 4.93	1.8368	4 47 59.9	19.749	12	13 36 51.82	1.9321	5 43 40.2	13.277
13	12 8 55.14	1.8371	4 35 14.1	19.777	13	13 38 47.86	1.9359	5 56 56.5	13.268
14	12 10 45.38	1.8375	4 22 26.7	19.804	14	13 40 44.13	1.9398	6 10 12.3	13.258
15	12 12 35.64	1.8379	4 9 37.6	19.831	15	13 42 40.63	1.9437	6 23 27.5	13.247
16	12 14 25.93	1.8384	3 56 46.9	19.856	16	13 44 37.37	1.9477	6 36 42.0	13.235
17	12 16 16.25	1.8390	3 43 54.8	19.881	17	13 46 34.36	1.9518	6 49 55.7	13.222
18	12 18 6.61	1.8397	3 31 1.2	19.906	18	13 48 31.59	1.9559	7 3 8.6	13.207
19	12 19 57.01	1.8404	3 18 6.1	19.930	19	13 50 29.07	1.9603	7 16 20.6	13.192
20	12 21 47.46	1.8412	3 5 9.6	19.953	20	13 52 26.81	1.9646	7 29 31.7	13.176
21	12 23 37.96	1.8421	2 52 11.7	19.976	21	13 54 24.82	1.9690	7 42 41.7	13.158
22	12 25 28.51	1.8429	2 39 12.4	19.998	22	13 56 23.09	1.9734	7 55 50.6	13.139
23	12 27 19.11	1.8438	N. 2 26 11.9	13.019	23	13 58 21.63	1.9779	S. 8 8 58.4	13.121
SATURDAY 6.					MONDAY 8.				
0	12 29 9.77	1.8449	N. 2 13 10.1	13.040	0	14 0 20.44	1.9825	S. 8 22 5.1	13.101
1	12 31 0.50	1.8461	2 0 7.1	13.060	1	14 2 19.53	1.9872	8 35 10.5	13.078
2	12 32 51.30	1.8473	1 47 2.9	13.079	2	14 4 18.90	1.9919	8 48 14.5	13.055
3	12 34 42.18	1.8486	1 33 57.6	13.098	3	14 6 18.56	1.9968	9 1 17.1	13.031
4	12 36 33.14	1.8500	1 20 51.2	13.116	4	14 8 18.51	2.0017	9 14 18.2	13.007
5	12 38 24.18	1.8514	1 7 43.7	13.133	5	14 10 18.76	2.0066	9 27 17.9	12.982
6	12 40 15.31	1.8529	0 54 35.2	13.149	6	14 12 19.30	2.0116	9 40 16.0	12.954
7	12 42 6.53	1.8545	0 41 25.8	13.164	7	14 14 20.15	2.0167	9 53 12.4	12.925
8	12 43 57.85	1.8561	0 28 15.5	13.180	8	14 16 21.31	2.0219	10 6 7.0	12.895
9	12 45 49.27	1.8578	0 15 4.2	13.195	9	14 18 22.78	2.0271	10 18 59.8	12.864
10	12 47 40.79	1.8596	N. 0 1 52.1	13.208	10	14 20 24.56	2.0324	10 31 50.7	12.832
11	12 49 32.42	1.8615	S. 0 11 20.7	13.220	11	14 22 26.67	2.0378	10 44 39.6	12.798
12	12 51 24.17	1.8635	0 24 34.3	13.232	12	14 24 29.10	2.0432	10 57 26.5	12.764
13	12 53 16.04	1.8655	0 37 48.6	13.244	13	14 26 31.86	2.0487	11 10 11.3	12.728
14	12 55 8.03	1.8675	0 51 3.6	13.255	14	14 28 34.95	2.0543	11 22 53.9	12.691
15	12 57 0.14	1.8696	1 4 19.2	13.264	15	14 30 38.38	2.0600	11 35 34.3	12.653
16	12 58 52.38	1.8718	1 17 35.3	13.273	16	14 32 42.15	2.0657	11 48 12.3	12.613
17	13 0 44.76	1.8742	1 30 51.9	13.281	17	14 34 46.26	2.0714	12 0 47.9	12.572
18	13 2 37.29	1.8767	1 44 9.0	13.288	18	14 36 50.72	2.0772	12 13 21.0	12.530
19	13 4 29.96	1.8791	1 57 26.5	13.295	19	14 38 55.53	2.0832	12 25 51.5	12.487
20	13 6 22.78	1.8816	2 10 44.4	13.301	20	14 41 0.70	2.0892	12 38 19.4	12.442
21	13 8 15.75	1.8842	2 24 2.6	13.306	21	14 43 6.23	2.0952	12 50 44.6	12.396
22	13 10 8.88	1.8868	2 37 21.1	13.310	22	14 45 12.12	2.1012	13 3 6.9	12.348
23	13 12 2.17	1.8896	2 50 39.9	13.313	23	14 47 18.38	2.1073	13 15 26.3	12.300
24	13 13 55.63	1.8924	S. 3 3 58.7	13.316	24	14 49 25.00	2.1134	S. 13 27 42.8	12.249

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	^h 14 ^m 49 ^s 25.00	2.1134	S. 13° 27' 42.8"	12.949	0	^h 16 ^m 38 ^s 46.11	2.1499	S. 21° 48' 46.3"	6.006
1	14 51 31.99	2.1197	13 39 56.2	12.197	1	16 41 13.27	2.4561	21 56 42.9	7.879
2	14 53 39.37	2.1261	13 52 6.5	12.144	2	16 43 40.84	2.4620	22 4 31.8	7.749
3	14 55 47.13	2.1325	14 4 13.5	12.089	3	16 46 8.82	2.4697	22 12 12.8	7.617
4	14 57 55.27	2.1389	14 16 17.2	12.033	4	16 48 37.20	2.4764	22 19 45.9	7.484
5	15 0 3.80	2.1454	14 28 17.5	11.976	5	16 51 5.99	2.4831	22 27 10.9	7.349
6	15 2 12.72	2.1519	14 40 14.3	11.917	6	16 53 35.18	2.4898	22 34 27.8	7.213
7	15 4 22.03	2.1585	14 52 7.5	11.857	7	16 56 4.77	2.4964	22 41 36.5	7.075
8	15 6 31.74	2.1651	15 3 57.1	11.795	8	16 58 34.75	2.5030	22 48 36.8	6.934
9	15 8 41.84	2.1717	15 15 42.9	11.732	9	17 1 5.11	2.5099	22 55 28.6	6.793
10	15 10 52.34	2.1784	15 27 24.9	11.667	10	17 3 35.85	2.5155	23 2 11.9	6.651
11	15 13 3.25	2.1852	15 39 2.9	11.600	11	17 6 6.97	2.5218	23 8 46.7	6.507
12	15 15 14.57	2.1921	15 50 36.9	11.532	12	17 8 38.47	2.5281	23 15 12.8	6.360
13	15 17 26.30	2.1989	16 2 6.8	11.463	13	17 11 10.34	2.5342	23 21 30.1	6.214
14	15 19 38.44	2.2058	16 13 32.5	11.392	14	17 13 42.57	2.5402	23 27 38.5	6.065
15	15 21 50.99	2.2127	16 24 53.8	11.319	15	17 16 15.16	2.5461	23 33 37.9	5.915
16	15 24 3.96	2.2197	16 36 10.7	11.245	16	17 18 48.10	2.5519	23 39 28.3	5.764
17	15 26 17.35	2.2267	16 47 23.2	11.170	17	17 21 21.39	2.5576	23 45 9.6	5.611
18	15 28 31.16	2.2337	16 58 31.1	11.092	18	17 23 55.01	2.5632	23 50 41.6	5.456
19	15 30 45.39	2.2407	17 9 34.3	11.013	19	17 26 28.97	2.5687	23 56 4.3	5.301
20	15 33 0.05	2.2476	17 20 32.7	10.932	20	17 29 3.26	2.5742	24 1 17.7	5.145
21	15 35 15.13	2.2549	17 31 26.2	10.850	21	17 31 37.87	2.5795	24 6 21.7	4.987
22	15 37 30.64	2.2621	17 42 14.7	10.767	22	17 34 12.80	2.5847	24 11 16.1	4.827
23	15 39 46.58	2.2692	S. 17° 52' 58.2"	10.682	23	17 36 48.03	2.5897	S. 24° 16' 0.9"	4.666
WEDNESDAY 10.					FRIDAY 12.				
0	15 42 2.95	2.2764	S. 18° 3 36.5"	10.594	0	17 39 23.56	2.5947	S. 24° 20 36.0"	4.504
1	15 44 19.75	2.2837	18 14 9.5	10.506	1	17 41 59.39	2.5995	24 25 1.3	4.341
2	15 46 36.99	2.2909	18 24 37.2	10.416	2	17 44 35.50	2.6042	24 29 16.9	4.178
3	15 48 54.66	2.2981	18 34 59.4	10.324	3	17 47 11.89	2.6087	24 33 22.6	4.013
4	15 51 12.76	2.3053	18 45 16.1	10.231	4	17 49 48.55	2.6132	24 37 18.4	3.847
5	15 53 31.30	2.3126	18 55 27.1	10.135	5	17 52 25.47	2.6175	24 41 4.2	3.679
6	15 55 50.28	2.3199	19 5 32.3	10.038	6	17 55 2.65	2.6217	24 44 39.9	3.511
7	15 58 9.69	2.3272	19 15 31.7	9.940	7	17 57 40.08	2.6257	24 48 5.5	3.342
8	16 0 29.54	2.3344	19 25 25.1	9.839	8	18 0 17.74	2.6296	24 51 20.9	3.171
9	16 2 49.82	2.3317	19 35 12.4	9.737	9	18 2 55.63	2.6333	24 54 26.0	2.999
10	16 5 10.54	2.3390	19 44 53.6	9.634	10	18 5 33.74	2.6369	24 57 20.8	2.827
11	16 7 31.70	2.3463	19 54 28.5	9.529	11	18 8 12.06	2.6404	25 0 5.2	2.654
12	16 9 53.30	2.3536	20 3 57.1	9.422	12	18 10 50.50	2.6437	25 2 39.3	2.481
13	16 12 15.33	2.3708	20 13 19.2	9.313	13	18 13 29.31	2.6469	25 5 2.9	2.306
14	16 14 37.80	2.3781	20 22 34.7	9.203	14	18 16 8.22	2.6499	25 7 16.0	2.131
15	16 17 0.70	2.3853	20 31 43.5	9.091	15	18 18 47.30	2.6527	25 9 18.6	1.955
16	16 19 24.03	2.3924	20 40 45.6	8.977	16	18 21 26.54	2.6553	25 11 10.6	1.779
17	16 21 47.79	2.3997	20 49 40.8	8.862	17	18 24 5.94	2.6579	25 12 52.0	1.602
18	16 24 11.99	2.4069	20 58 29.0	8.744	18	18 26 45.49	2.6602	25 14 22.8	1.424
19	16 26 36.62	2.4140	21 7 10.1	8.626	19	18 29 25.17	2.6624	25 15 42.9	1.245
20	16 29 1.67	2.4210	21 15 44.1	8.506	20	18 32 4.98	2.6646	25 16 52.2	1.066
21	16 31 27.14	2.4281	21 24 10.8	8.383	21	18 34 44.92	2.6665	25 17 50.8	0.887
22	16 33 53.04	2.4352	21 32 30.1	8.260	22	18 37 24.96	2.6681	25 18 38.6	0.707
23	16 36 19.36	2.4422	21 40 42.0	8.135	23	18 40 5.09	2.6696	25 19 15.6	0.527
24	16 38 46.11	2.4492	S. 21° 48 46.3"	8.006	24	18 42 45.31	2.6710	S. 25° 19 41.9"	0.347

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	18 ^h 42 ^m 45.31 ^s	2.6710	S. 25° 19' 41.9"	0.347	0	20 ^h 49 ^m 29.73 ^s	2.5559	S. 22° 12' 37.4"	7.874
1	18 45 25.61	2.6722	25 19 57.3	- 0.167	1	20 52 2.93	2.5506	22 4 40.5	8.092
2	18 48 5.98	2.6739	25 20 1.9	+ 0.014	2	20 54 35.80	2.5451	21 56 34.7	8.168
3	18 50 46.40	2.6741	25 19 55.6	0.196	3	20 57 8.34	2.5396	21 48 20.3	8.312
4	18 53 26.87	2.6748	25 19 38.4	0.377	4	20 59 40.55	2.5341	21 39 57.3	8.456
5	18 56 7.38	2.6753	25 19 10.4	0.558	5	21 2 12.43	2.5285	21 31 25.7	8.597
6	18 58 47.91	2.6757	25 18 31.5	0.739	6	21 4 43.97	2.5228	21 22 45.7	8.737
7	19 1 28.46	2.6759	25 17 41.7	0.921	7	21 7 15.17	2.5171	21 13 57.3	8.875
8	19 4 9.02	2.6759	25 16 41.0	1.102	8	21 9 46.03	2.5114	21 5 0.7	9.012
9	19 6 49.57	2.6757	25 15 29.5	1.283	9	21 12 16.54	2.5056	20 55 55.9	9.148
10	19 9 30.11	2.6755	25 14 7.1	1.464	10	21 14 46.70	2.4997	20 46 43.0	9.282
11	19 12 10.63	2.6750	25 12 33.8	1.645	11	21 17 16.51	2.4938	20 37 22.1	9.413
12	19 14 51.11	2.6743	25 10 49.7	1.826	12	21 19 45.96	2.4878	20 27 53.4	9.543
13	19 17 31.55	2.6736	25 8 54.7	2.007	13	21 22 15.05	2.4819	20 18 16.9	9.672
14	19 20 11.94	2.6726	25 6 48.9	2.187	14	21 24 43.79	2.4760	20 8 32.7	9.800
15	19 22 52.26	2.6714	25 4 32.3	2.367	15	21 27 12.17	2.4700	19 58 40.9	9.926
16	19 25 32.51	2.6702	25 2 4.9	2.547	16	21 29 40.19	2.4639	19 48 41.6	10.050
17	19 28 12.68	2.6687	24 59 26.7	2.726	17	21 32 7.84	2.4578	19 38 34.9	10.172
18	19 30 52.75	2.6670	24 56 37.8	2.904	18	21 34 35.13	2.4517	19 28 21.0	10.292
19	19 33 32.72	2.6653	24 53 38.2	3.083	19	21 37 2.05	2.4456	19 17 59.9	10.412
20	19 36 12.59	2.6634	24 50 27.9	3.261	20	21 39 28.60	2.4395	19 7 31.6	10.530
21	19 38 52.33	2.6613	24 47 6.9	3.438	21	21 41 54.79	2.4334	18 56 56.3	10.646
22	19 41 31.94	2.6591	24 43 35.3	3.614	22	21 44 20.61	2.4273	18 46 14.1	10.759
23	19 44 11.42	2.6567	S. 24 39 53.2	3.790	23	21 46 46.06	2.4212	S. 18 35 25.2	10.871
SUNDAY 14.					TUESDAY 16.				
0	19 46 50.75	2.6542	S. 24 36 0.5	3.966	0	21 49 11.15	2.4151	S. 18 24 29.6	10.983
1	19 49 29.92	2.6515	24 31 57.3	4.140	1	21 51 35.87	2.4089	18 13 27.3	11.092
2	19 52 8.93	2.6487	24 27 43.7	4.314	2	21 54 0.21	2.4027	18 2 18.6	11.196
3	19 54 47.76	2.6457	24 23 19.6	4.487	3	21 56 24.19	2.3966	17 51 3.5	11.304
4	19 57 26.41	2.6426	24 18 45.2	4.659	4	21 58 47.80	2.3905	17 39 42.1	11.406
5	20 0 4.87	2.6393	24 14 0.5	4.830	5	22 1 11.05	2.3844	17 28 14.5	11.510
6	20 2 43.13	2.6360	24 9 5.6	5.000	6	22 3 33.93	2.3783	17 16 40.9	11.610
7	20 5 21.19	2.6326	24 4 0.5	5.170	7	22 5 56.45	2.3722	17 5 1.3	11.709
8	20 7 59.03	2.6292	23 58 45.2	5.338	8	22 8 18.60	2.3661	16 53 15.8	11.807
9	20 10 36.65	2.6251	23 53 19.9	5.505	9	22 10 40.38	2.3600	16 41 24.4	11.903
10	20 13 14.04	2.6212	23 47 44.6	5.673	10	22 13 1.80	2.3541	16 29 27.4	12.007
11	20 15 51.19	2.6172	23 41 59.3	5.838	11	22 15 22.87	2.3482	16 17 24.8	12.098
12	20 18 28.10	2.6131	23 36 4.1	6.002	12	22 17 43.58	2.3422	16 5 16.8	12.178
13	20 21 4.76	2.6088	23 29 59.1	6.164	13	22 20 3.93	2.3362	15 53 3.4	12.267
14	20 23 41.16	2.6045	23 23 44.4	6.326	14	22 22 23.93	2.3303	15 40 44.7	12.354
15	20 26 17.30	2.6001	23 17 20.0	6.487	15	22 24 43.57	2.3244	15 28 20.9	12.439
16	20 28 53.17	2.5956	23 10 46.0	6.647	16	22 27 2.86	2.3186	15 15 52.0	12.523
17	20 31 28.77	2.5910	23 4 2.4	6.805	17	22 29 21.81	2.3129	15 3 18.1	12.606
18	20 34 4.08	2.5861	22 57 9.4	6.961	18	22 31 40.41	2.3072	14 50 39.2	12.687
19	20 36 39.10	2.5813	22 50 7.1	7.117	19	22 33 58.67	2.3014	14 37 55.6	12.766
20	20 39 13.83	2.5764	22 42 55.4	7.272	20	22 36 16.58	2.2957	14 25 7.3	12.843
21	20 41 48.27	2.5714	22 35 34.5	7.424	21	22 38 34.15	2.2901	14 12 14.5	12.918
22	20 44 22.40	2.5663	22 28 4.5	7.576	22	22 40 51.39	2.2846	13 59 17.2	12.992
23	20 46 56.22	2.5611	22 20 25.4	7.726	23	22 43 8.30	2.2790	13 46 15.5	13.064
24	20 49 29.73	2.5559	S. 22 12 37.4	7.874	24	22 45 24.87	2.2735	S. 13 33 9.5	13.136

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	^h 22 ^m 45 ^s 24.87	2.9735	S. 13° 33' 9.5	13.135	0	^h 0 29 26.60	2.0687	S. 2° 10' 21.8	14.765
1	22 47 41.12	2.9681	13 19 59.3	13.904	1	0 31 31.86	2.0687	1 55 35.9	14.766
2	22 49 57.05	2.9627	13 6 45.0	13.971	2	0 33 37.01	2.0648	1 40 49.9	14.766
3	22 52 12.65	2.9573	12 53 26.8	13.336	3	0 35 42.04	2.0629	1 26 4.0	14.764
4	22 54 27.93	2.9521	12 40 4.7	13.401	4	0 37 46.96	2.0612	1 11 18.2	14.761
5	22 56 42.90	2.9470	12 26 38.7	13.464	5	0 39 51.78	2.0795	0 56 32.7	14.756
6	22 58 57.57	2.9419	12 13 9.0	13.525	6	0 41 56.50	2.0779	0 41 47.5	14.750
7	23 1 11.93	2.9368	11 59 35.7	13.584	7	0 44 1.13	2.0764	0 27 2.7	14.743
8	23 3 25.98	2.9317	11 45 58.9	13.642	8	0 46 5.67	2.0749	S. 0 12 18.3	14.736
9	23 5 39.73	2.9267	11 32 18.7	13.698	9	0 48 10.12	2.0735	N. 0 2 25.6	14.737
10	23 7 53.18	2.9218	11 18 35.1	13.753	10	0 50 14.49	2.0722	0 17 8.9	14.716
11	23 10 6.35	2.9171	11 4 48.3	13.807	11	0 52 18.79	2.0710	0 31 51.5	14.704
12	23 12 19.23	2.9123	10 50 58.3	13.858	12	0 54 23.01	2.0698	0 46 33.4	14.692
13	23 14 31.83	2.9076	10 37 5.3	13.908	13	0 56 27.16	2.0687	1 1 14.5	14.678
14	23 16 44.14	2.9029	10 23 9.3	13.957	14	0 58 31.26	2.0678	1 15 54.7	14.662
15	23 18 56.17	2.1982	10 9 10.5	14.004	15	1 0 35.30	2.0669	1 30 33.9	14.645
16	23 21 7.93	2.1937	9 55 8.9	14.050	16	1 2 39.29	2.0661	1 45 12.1	14.626
17	23 23 19.42	2.1893	9 41 4.5	14.094	17	1 4 43.23	2.0653	1 59 49.3	14.610
18	23 25 30.65	2.1850	9 26 57.6	14.136	18	1 6 47.12	2.0645	2 14 25.3	14.590
19	23 27 41.62	2.1807	9 12 48.2	14.177	19	1 8 50.97	2.0639	2 29 0.1	14.569
20	23 29 52.33	2.1764	8 58 36.3	14.217	20	1 10 54.79	2.0634	2 43 33.6	14.547
21	23 32 2.79	2.1723	8 44 22.1	14.256	21	1 12 58.58	2.0629	2 58 5.7	14.523
22	23 34 13.01	2.1682	8 30 5.6	14.293	22	1 15 2.34	2.0625	3 12 36.4	14.499
23	23 36 22.98	2.1642	S. 8 15 46.9	14.328	23	1 17 6.08	2.0622	N. 3 27 5.6	14.473
THURSDAY 18.					SATURDAY 20.				
0	23 38 32.71	2.1602	S. 8 1 26.2	14.362	0	1 19 9.80	2.0619	N. 3 41 33.2	14.447
1	23 40 42.21	2.1564	7 47 3.5	14.394	1	1 21 13.51	2.0617	3 55 59.2	14.419
2	23 42 51.48	2.1526	7 32 38.9	14.426	2	1 23 17.21	2.0617	4 10 23.5	14.390
3	23 45 0.52	2.1488	7 18 12.4	14.456	3	1 25 20.91	2.0617	4 24 46.0	14.359
4	23 47 9.34	2.1452	7 3 44.2	14.483	4	1 27 24.61	2.0617	4 39 6.6	14.326
5	23 49 17.95	2.1417	6 49 14.4	14.510	5	1 29 28.31	2.0617	4 53 25.4	14.297
6	23 51 26.35	2.1382	6 34 43.0	14.536	6	1 31 32.01	2.0618	5 7 42.2	14.263
7	23 53 34.54	2.1348	6 20 10.1	14.560	7	1 33 35.73	2.0621	5 21 56.9	14.228
8	23 55 42.53	2.1314	6 5 35.8	14.582	8	1 35 39.47	2.0624	5 36 9.5	14.193
9	23 57 50.31	2.1281	5 51 0.2	14.603	9	1 37 43.22	2.0627	5 50 20.0	14.156
10	23 59 57.90	2.1250	5 36 23.4	14.623	10	1 39 47.00	2.0629	6 4 28.2	14.118
11	0 2 5.31	2.1220	5 21 45.4	14.642	11	1 41 50.81	2.0637	6 18 34.1	14.079
12	0 4 12.54	2.1190	5 7 6.3	14.660	12	1 43 54.65	2.0643	6 32 37.7	14.039
13	0 6 19.59	2.1160	4 52 26.2	14.676	13	1 45 58.53	2.0650	6 46 38.8	13.997
14	0 8 26.46	2.1131	4 37 45.2	14.690	14	1 48 2.45	2.0657	7 0 37.4	13.955
15	0 10 33.16	2.1102	4 23 3.4	14.703	15	1 50 6.41	2.0664	7 14 33.4	13.911
16	0 12 39.69	2.1076	4 8 20.8	14.716	16	1 52 10.42	2.0673	7 28 26.7	13.867
17	0 14 46.07	2.1050	3 53 37.5	14.727	17	1 54 14.48	2.0682	7 42 17.4	13.822
18	0 16 52.29	2.1024	3 38 53.6	14.737	18	1 56 18.60	2.0691	7 56 5.3	13.775
19	0 18 58.36	2.0999	3 24 9.1	14.745	19	1 58 22.77	2.0701	8 9 50.4	13.727
20	0 21 4.28	2.0975	3 9 24.2	14.751	20	2 0 27.01	2.0712	8 23 32.6	13.678
21	0 23 10.06	2.0952	2 54 39.0	14.756	21	2 2 31.32	2.0724	8 37 11.8	13.628
22	0 25 15.71	2.0930	2 39 53.5	14.761	22	2 4 35.70	2.0736	8 50 48.0	13.577
23	0 27 21.22	2.0907	2 25 7.7	14.764	23	2 6 40.15	2.0748	9 4 21.1	13.525
24	0 29 26.60	2.0887	S. 2 10 21.8	14.765	24	2 8 44.68	2.0761	N. 9 17 51.0	13.473

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	^h 2 ^m 8 ^s 44.68	2.0761	N. 9° 17' 51.0"	13.472	0	^h 3 ^m 50 ^s 46.22	2.1868	N. 18° 43' 36.2"	9.716
1	2 10 49.29	2.0775	9 31 17.7	13.418	1	3 52 57.51	2.1886	18 53 16.1	9.614
2	2 12 53.98	2.0789	9 44 41.2	13.363	2	3 55 8.97	2.1904	19 2 49.9	9.512
3	2 14 58.76	2.0804	9 58 1.3	13.307	3	3 57 20.60	2.1952	19 12 17.5	9.408
4	2 17 3.63	2.0820	10 11 18.0	13.249	4	3 59 32.39	2.1979	19 21 38.8	9.303
5	2 19 8.60	2.0836	10 24 31.2	13.191	5	4 1 44.35	2.2007	19 30 53.9	9.198
6	2 21 13.66	2.0852	10 37 40.9	13.133	6	4 3 56.48	2.2035	19 40 2.6	9.092
7	2 23 18.82	2.0868	10 50 47.0	13.071	7	4 6 8.77	2.2063	19 49 4.9	8.984
8	2 25 24.08	2.0886	11 3 49.4	13.009	8	4 8 21.23	2.2090	19 58 0.7	8.876
9	2 27 29.45	2.0904	11 16 48.1	12.947	9	4 10 33.85	2.2117	20 6 50.1	8.768
10	2 29 34.93	2.0923	11 29 43.0	12.883	10	4 12 46.63	2.2144	20 15 32.9	8.660
11	2 31 40.52	2.0942	11 42 34.0	12.818	11	4 14 59.57	2.2171	20 24 9.1	8.547
12	2 33 46.23	2.0961	11 55 21.1	12.753	12	4 17 12.68	2.2196	20 32 38.6	8.436
13	2 35 52.05	2.0980	12 8 4.3	12.686	13	4 19 25.95	2.2224	20 41 1.4	8.324
14	2 37 57.99	2.1001	12 20 43.4	12.618	14	4 21 39.37	2.2250	20 49 17.5	8.212
15	2 40 4.06	2.1022	12 33 18.4	12.549	15	4 23 52.95	2.2276	20 57 26.9	8.099
16	2 42 10.25	2.1043	12 45 49.3	12.479	16	4 26 6.68	2.2302	21 5 29.4	7.984
17	2 44 16.57	2.1064	12 58 15.9	12.407	17	4 28 20.57	2.2327	21 13 25.0	7.870
18	2 46 23.02	2.1086	13 10 38.2	12.335	18	4 30 34.61	2.2352	21 21 13.8	7.755
19	2 48 29.60	2.1108	13 22 56.1	12.262	19	4 32 48.80	2.2377	21 28 55.6	7.638
20	2 50 36.32	2.1131	13 35 9.7	12.189	20	4 35 3.13	2.2401	21 36 30.3	7.520
21	2 52 43.17	2.1153	13 47 18.8	12.114	21	4 37 17.61	2.2425	21 43 58.0	7.402
22	2 54 50.16	2.1177	13 59 23.4	12.038	22	4 39 32.23	2.2449	21 51 18.6	7.283
23	2 56 57.30	2.1200	N. 14° 11' 23.4"	11.961	23	4 41 47.00	2.2473	N. 21° 58' 32.0"	7.164
MONDAY 22.					WEDNESDAY 24.				
0	2 59 4.58	2.1226	N. 14° 23' 18.7"	11.889	0	4 44 1.91	2.2497	N. 22° 5' 38.3"	7.045
1	3 1 12.01	2.1250	14 35 9.3	11.803	1	4 46 16.96	2.2519	22 12 37.4	6.924
2	3 3 19.58	2.1274	14 46 55.1	11.723	2	4 48 32.14	2.2541	22 19 29.2	6.803
3	3 5 27.30	2.1299	14 58 36.1	11.643	3	4 50 47.45	2.2562	22 26 13.7	6.681
4	3 7 35.17	2.1324	15 10 12.2	11.561	4	4 53 2.89	2.2583	22 32 50.9	6.559
5	3 9 43.19	2.1350	15 21 43.4	11.478	5	4 55 18.45	2.2603	22 39 20.8	6.437
6	3 11 51.37	2.1376	15 33 9.5	11.393	6	4 57 34.13	2.2624	22 45 43.3	6.313
7	3 13 59.70	2.1402	15 44 30.5	11.308	7	4 59 49.94	2.2645	22 51 58.3	6.188
8	3 16 8.19	2.1428	15 55 46.4	11.223	8	5 2 5.87	2.2664	22 58 5.9	6.064
9	3 18 16.84	2.1455	16 6 57.2	11.136	9	5 4 21.91	2.2683	23 4 6.0	5.939
10	3 20 25.65	2.1482	16 18 2.7	11.047	10	5 6 38.06	2.2701	23 9 58.6	5.813
11	3 22 34.62	2.1508	16 29 2.9	10.958	11	5 8 54.32	2.2718	23 15 43.6	5.687
12	3 24 43.75	2.1535	16 39 57.7	10.868	12	5 11 10.68	2.2735	23 21 21.0	5.560
13	3 26 53.04	2.1562	16 50 47.1	10.777	13	5 13 27.14	2.2752	23 26 50.8	5.432
14	3 29 2.50	2.1590	17 1 31.0	10.686	14	5 15 43.70	2.2768	23 32 12.9	5.305
15	3 31 12.12	2.1617	17 12 9.4	10.593	15	5 18 0.36	2.2784	23 37 27.4	5.177
16	3 33 21.91	2.1645	17 22 42.2	10.499	16	5 20 17.11	2.2799	23 42 34.2	5.048
17	3 35 31.86	2.1673	17 33 9.3	10.404	17	5 22 33.94	2.2819	23 47 31.2	4.919
18	3 37 41.98	2.1701	17 43 30.7	10.309	18	5 24 50.85	2.2838	23 52 24.5	4.790
19	3 39 52.27	2.1729	17 53 46.4	10.212	19	5 27 7.84	2.2858	23 57 8.0	4.660
20	3 42 2.73	2.1757	18 3 56.2	10.114	20	5 29 24.91	2.2881	24 1 43.7	4.531
21	3 44 13.35	2.1784	18 14 0.1	10.016	21	5 31 42.05	2.2899	24 6 11.7	4.401
22	3 46 24.14	2.1812	18 23 58.1	9.917	22	5 33 59.26	2.2919	24 10 31.8	4.269
23	3 48 35.10	2.1840	18 33 50.2	9.817	23	5 36 16.52	2.2939	24 14 44.0	4.138
24	3 50 46.22	2.1868	N. 18° 43' 36.2"	9.716	24	5 38 33.84	2.2961	N. 24° 18' 48.4"	4.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	5 ^h 38 ^m 33.84	2.9891	N.24° 18' 48.4"	4.007	0	7 ^h 28 ^m 2.84	2.9425	N.24° 58' 26.0"	2.301
1	5 40 51.21	2.9900	24 22 44.9	3.876	1	7 30 17.31	2.9397	24 56 4.2	2.495
2	5 43 8.64	2.9909	24 26 33.5	3.744	2	7 32 31.61	2.9368	24 53 35.0	2.548
3	5 45 26.12	2.9917	24 30 14.1	3.611	3	7 34 45.73	2.9338	24 50 58.4	2.671
4	5 47 43.64	2.9922	24 33 46.8	3.478	4	7 36 59.67	2.9308	24 48 14.4	2.794
5	5 50 1.19	2.9927	24 37 11.5	3.346	5	7 39 13.43	2.9278	24 45 23.1	2.917
6	5 52 18.77	2.9932	24 40 28.3	3.213	6	7 41 27.01	2.9237	24 42 24.4	3.039
7	5 54 36.38	2.9937	24 43 37.1	3.080	7	7 43 40.40	2.9195	24 39 18.4	3.160
8	5 56 54.01	2.9940	24 46 37.9	2.948	8	7 45 53.59	2.9153	24 36 5.2	3.280
9	5 59 11.66	2.9943	24 49 30.8	2.815	9	7 48 6.59	2.9110	24 32 44.8	3.400
10	6 1 29.33	2.9945	24 52 15.7	2.681	10	7 50 19.39	2.9117	24 29 17.2	3.519
11	6 3 47.00	2.9945	24 54 52.5	2.547	11	7 52 31.99	2.9083	24 25 42.5	3.637
12	6 6 4.67	2.9945	24 57 21.3	2.413	12	7 54 44.38	2.9048	24 22 0.7	3.755
13	6 8 22.34	2.9945	24 59 42.1	2.280	13	7 56 56.56	2.9013	24 18 11.9	3.873
14	6 10 40.01	2.9944	25 1 54.9	2.147	14	7 59 8.53	2.9078	24 14 16.0	3.990
15	6 12 57.67	2.9942	25 3 59.7	2.013	15	8 1 20.30	2.9043	24 10 13.1	4.106
16	6 15 15.32	2.9939	25 5 56.5	1.880	16	8 3 31.85	2.9006	24 6 3.3	4.220
17	6 17 32.94	2.9934	25 7 45.3	1.746	17	8 5 43.17	2.8968	24 1 46.7	4.334
18	6 19 50.53	2.9929	25 9 26.0	1.612	18	8 7 54.27	2.8931	23 57 23.2	4.448
19	6 22 8.09	2.9924	25 10 58.7	1.478	19	8 10 5.15	2.8894	23 52 52.9	4.562
20	6 24 25.62	2.9919	25 12 23.4	1.345	20	8 12 15.80	2.8856	23 48 15.8	4.674
21	6 26 43.12	2.9912	25 13 40.1	1.212	21	8 14 26.22	2.8817	23 43 32.0	4.786
22	6 29 0.57	2.9903	25 14 48.8	1.078	22	8 16 36.41	2.8779	23 38 41.5	4.897
23	6 31 17.96	2.9894	N.25 15 49.5	0.944	23	8 18 46.37	2.8740	N.23 33 44.4	5.007
FRIDAY 26.					SUNDAY 28.				
0	6 33 35.30	2.9885	N.25 16 42.1	0.811	0	8 20 56.09	2.8600	N.23 28 40.7	5.117
1	6 35 52.58	2.9875	25 17 26.8	0.678	1	8 23 5.57	2.8561	23 23 30.4	5.225
2	6 38 9.80	2.9864	25 18 3.5	0.546	2	8 25 14.82	2.8521	23 18 13.7	5.333
3	6 40 26.95	2.9852	25 18 32.3	0.413	3	8 27 23.83	2.8481	23 12 50.5	5.440
4	6 42 44.03	2.9839	25 18 53.1	0.281	4	8 29 32.59	2.8440	23 7 20.9	5.546
5	6 45 1.02	2.9825	25 19 6.0	0.148	5	8 31 41.11	2.8400	23 1 45.0	5.652
6	6 47 17.93	2.9811	25 19 10.9	+ 0.016	6	8 33 49.39	2.8359	22 56 2.7	5.757
7	6 49 34.76	2.9797	25 19 7.9	- 0.116	7	8 35 57.42	2.8317	22 50 14.2	5.860
8	6 51 51.49	2.9780	25 18 57.0	0.947	8	8 38 5.20	2.8276	22 44 19.5	5.963
9	6 54 8.12	2.9763	25 18 38.3	0.377	9	8 40 12.73	2.8234	22 38 18.6	6.066
10	6 56 24.65	2.9746	25 18 11.7	0.508	10	8 42 20.01	2.8193	22 32 11.6	6.168
11	6 58 41.07	2.9728	25 17 37.3	0.639	11	8 44 27.04	2.8151	22 25 58.5	6.269
12	7 0 57.39	2.9710	25 16 55.0	0.770	12	8 46 33.82	2.8108	22 19 39.3	6.369
13	7 3 13.59	2.9690	25 16 4.9	0.899	13	8 48 40.34	2.8066	22 13 14.2	6.468
14	7 5 29.67	2.9669	25 15 7.1	1.028	14	8 50 46.61	2.8024	22 6 43.2	6.567
15	7 7 45.62	2.9648	25 14 1.5	1.158	15	8 52 52.63	2.7981	22 0 6.2	6.665
16	7 10 1.44	2.9626	25 12 48.1	1.287	16	8 54 58.39	2.7938	21 53 23.4	6.761
17	7 12 17.13	2.9603	25 11 27.0	1.415	17	8 57 3.89	2.7896	21 46 34.9	6.856
18	7 14 32.68	2.9579	25 9 58.3	1.543	18	8 59 9.14	2.7853	21 39 40.7	6.951
19	7 16 48.08	2.9555	25 8 21.9	1.670	19	9 1 14.13	2.7811	21 32 40.8	7.046
20	7 19 3.34	2.9531	25 6 37.9	1.798	20	9 3 18.87	2.7768	21 25 35.2	7.140
21	7 21 18.45	2.9506	25 4 46.2	1.924	21	9 5 23.35	2.7725	21 18 24.0	7.233
22	7 23 33.41	2.9480	25 2 47.0	2.049	22	9 7 27.57	2.7683	21 11 7.3	7.324
23	7 25 48.21	2.9453	25 0 40.3	2.175	23	9 9 31.53	2.7639	21 3 45.1	7.415
24	7 28 2.84	2.9425	N.24 58 26.0	2.301	24	9 11 35.24	2.7597	N.20 56 17.5	7.506

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 29.					WEDNESDAY 31.				
0	9 11 35.24	2.0597	N. 20° 56' 17.5	7.505	0	10 45 51.54	1.8801	N. 13° 27' 28.3	10.897
1	9 13 38.69	2.0554	20 48 44.5	7.594	1	10 47 44.26	1.8773	13 16 32.9	10.949
2	9 15 41.89	2.0511	20 41 6.2	7.683	2	10 49 36.82	1.8746	13 5 34.4	11.001
3	9 17 44.83	2.0468	20 33 22.5	7.773	3	10 51 29.21	1.8718	12 54 32.8	11.052
4	9 19 47.51	2.0426	20 25 33.6	7.858	4	10 53 21.44	1.8692	12 43 28.2	11.103
5	9 21 49.94	2.0383	20 17 39.5	7.944	5	10 55 13.51	1.8666	12 32 20.6	11.151
6	9 23 52.11	2.0341	20 9 40.3	8.029	6	10 57 5.43	1.8641	12 21 10.1	11.199
7	9 25 54.03	2.0299	20 1 36.0	8.113	7	10 58 57.20	1.8616	12 9 56.7	11.248
8	9 27 55.70	2.0257	19 53 26.7	8.197	8	11 0 48.82	1.8591	11 58 40.4	11.296
9	9 29 57.11	2.0214	19 45 12.3	8.281	9	11 2 40.29	1.8567	11 47 21.2	11.343
10	9 31 58.27	2.0173	19 36 53.0	8.363	10	11 4 31.62	1.8544	11 35 59.2	11.389
11	9 33 59.18	2.0132	19 28 28.9	8.443	11	11 6 22.82	1.8522	11 24 24.5	11.434
12	9 35 59.85	2.0091	19 19 59.9	8.523	12	11 8 13.88	1.8499	11 13 7.2	11.478
13	9 38 0.27	2.0049	19 11 26.1	8.603	13	11 10 4.81	1.8478	11 1 37.2	11.523
14	9 40 0.44	2.0008	19 2 47.6	8.683	14	11 11 55.61	1.8457	10 50 4.5	11.567
15	9 42 0.36	1.9967	18 54 4.3	8.760	15	11 13 46.29	1.8436	10 38 29.2	11.609
16	9 44 0.04	1.9926	18 45 16.4	8.837	16	11 15 36.84	1.8416	10 26 51.4	11.651
17	9 45 59.47	1.9885	18 36 23.9	8.913	17	11 17 27.28	1.8397	10 15 11.1	11.693
18	9 47 58.66	1.9845	18 27 26.8	8.989	18	11 19 17.60	1.8378	10 3 28.2	11.735
19	9 49 57.61	1.9805	18 18 25.2	9.063	19	11 21 7.81	1.8360	9 51 42.9	11.774
20	9 51 56.32	1.9766	18 9 19.2	9.137	20	11 22 57.92	1.8343	9 39 55.3	11.813
21	9 53 54.80	1.9727	18 0 8.7	9.211	21	11 24 47.92	1.8326	9 28 5.3	11.852
22	9 55 53.04	1.9687	17 50 53.9	9.283	22	11 26 37.82	1.8309	9 16 13.0	11.891
23	9 57 51.05	1.9648	N. 17° 41' 34.8	9.354	23	11 28 27.63	1.8293	N. 9° 4' 18.4	11.928
TUESDAY 30.					THURSDAY, JANUARY 1, 1891.				
0	9 59 48.82	1.9609	N. 17° 32' 11.4	9.425	0	11 30 17.34	1.8277	N. 8° 52' 21.6	11.965
1	10 1 46.36	1.9571	17 22 43.8	9.495	PHASES OF THE MOON.				
2	10 3 43.68	1.9534	17 13 12.0	9.564					
3	10 5 40.77	1.9497	17 3 36.1	9.633					
4	10 7 37.64	1.9460	16 53 56.1	9.700					
5	10 9 34.29	1.9423	16 44 12.1	9.767	☾ Last Quarter . . Dec. 4 1 26.6				
6	10 11 30.71	1.9386	16 34 24.0	9.834	● New Moon 11 15 10.9				
7	10 13 26.92	1.9350	16 24 32.0	9.899	☽ First Quarter 18 8 36.3				
8	10 15 22.91	1.9314	16 14 36.1	9.963	○ Full Moon 25 17 57.0				
9	10 17 18.69	1.9279	16 4 36.4	10.027					
10	10 19 14.26	1.9244	15 54 32.9	10.090					
11	10 21 9.62	1.9210	15 44 25.6	10.152					
12	10 23 4.78	1.9176	15 34 14.6	10.214					
13	10 24 59.74	1.9143	15 23 59.9	10.275					
14	10 26 54.49	1.9109	15 13 41.6	10.335					
15	10 28 49.04	1.9076	15 3 19.7	10.395					
16	10 30 43.40	1.9043	14 52 54.2	10.453					
17	10 32 37.56	1.9011	14 42 25.3	10.511					
18	10 34 31.53	1.8980	14 31 52.9	10.568	☾ Apogee Dec. 2 18.4				
19	10 36 25.32	1.8948	14 21 17.1	10.625	☾ Perigee 14 12.6				
20	10 38 18.92	1.8918	14 10 37.9	10.681	☾ Apogee 30 14.0				
21	10 40 12.34	1.8888	13 59 55.4	10.736					
22	10 42 5.58	1.8859	13 49 9.6	10.790					
23	10 43 58.65	1.8830	13 38 20.6	10.844					
24	10 45 51.54	1.8801	N. 13° 27' 28.3	10.897					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis W.	89° 9' 22"	3143	90° 36' 30"	3150	92° 3' 48"	3156	93° 30' 50"	3169
	Aldebaran W.	58 27 39	3048	59 56 52	3054	61 25 58	3059	62 54 58	3064
	SATURN E.	40 33 56	3063	39 5 1	3070	37 36 15	3078	36 7 38	3085
	Spica E.	76 30 9	3054	75 1 3	3060	73 32 5	3067	72 3 16	3073
	SUN E.	123 11 9	3411	121 49 5	3417	120 27 8	3423	119 5 18	3429
2	Aldebaran W.	70 18 34	3084	71 47 3	3086	73 15 30	3088	74 43 54	3090
	Pollux W.	26 9 27	3105	27 37 30	3104	29 5 34	3103	30 33 39	3102
	SATURN E.	28 46 40	3119	27 18 53	3125	25 51 14	3131	24 23 42	3140
	Spica E.	64 40 50	3099	63 12 37	3103	61 44 29	3107	60 16 26	3109
	SUN E.	112 17 42	3454	110 56 26	3457	109 35 13	3460	108 14 4	3462
3	Aldebaran W.	82 5 30	3092	83 33 49	3091	85 2 9	3090	86 30 31	3088
	Pollux W.	37 54 18	3097	39 22 31	3095	40 50 46	3093	42 19 5	3090
	Spica E.	52 56 56	3118	51 29 8	3118	50 1 21	3119	48 33 34	3119
	SUN E.	101 28 41	3465	100 7 38	3464	98 46 34	3463	97 25 28	3460
4	Aldebaran W.	93 53 6	3079	95 21 50	3087	96 50 41	3082	98 19 37	3056
	Pollux W.	49 41 40	3069	51 10 27	3063	52 39 21	3056	54 8 22	3051
	Regulus W.	14 11 20	3264	15 36 14	3235	17 1 41	3281	18 27 40	3182
	Spica E.	41 14 44	3117	39 46 55	3117	38 19 5	3116	36 51 14	3115
	SUN E.	90 39 11	3443	89 17 43	3437	87 56 8	3431	86 34 27	3425
5	Pollux W.	61 25 33	3014	63 5 29	3005	64 35 36	2996	66 5 54	2985
	Regulus W.	25 45 9	3076	27 13 48	3059	28 42 48	3044	30 12 6	3030
	Spica E.	29 31 54	3118	28 4 6	3119	26 36 20	3124	25 8 40	3131
	SUN E.	79 44 1	3386	78 21 28	3376	76 58 44	3366	75 35 48	3356
6	Pollux W.	73 40 40	2931	75 12 20	2919	76 44 16	2906	78 16 27	2893
	Regulus W.	37 43 1	2958	39 14 6	2944	40 45 28	2929	42 17 9	2915
	SATURN W.	19 14 48	3003	20 44 57	2982	22 15 31	2969	23 46 31	2943
	SUN E.	68 38 0	3297	67 13 45	3284	65 49 14	3270	64 24 27	3256
7	Pollux W.	86 1 37	2825	87 35 33	2810	89 9 48	2795	90 44 22	2780
	Regulus W.	50 0 17	2840	51 33 53	2824	53 7 49	2808	54 42 5	2792
	SATURN W.	31 27 11	2857	23 0 25	2840	34 34 2	2823	36 8 0	2806
	SUN E.	57 16 21	3189	55 49 50	3166	54 23 0	3150	52 55 51	3134
8	Pollux W.	98 42 14	2702	100 18 51	2687	101 55 49	2671	103 33 8	2655
	Regulus W.	62 38 43	2712	64 15 7	2696	65 51 53	2680	67 29 2	2663
	SATURN W.	44 3 21	2722	45 39 32	2705	47 16 5	2687	48 53 2	2671
	SUN E.	45 35 3	3049	44 5 51	3039	42 36 17	3015	41 6 23	2998
9	Regulus W.	75 40 16	2580	77 19 39	2564	78 59 24	2548	80 39 30	2532
	SATURN W.	57 3 25	2587	58 42 38	2570	60 22 14	2554	62 2 12	2537
	SUN E.	33 31 20	2910	31 59 14	2893	30 26 45	2875	28 53 54	2859
13	SUN W.	18 18 28	2507	19 59 32	2502	21 40 43	2497	23 22 1	2493
	Fomalhaut E.	54 35 29	2459	52 53 18	2467	51 11 19	2478	49 29 35	2491
	α Pegasi E.	74 7 31	2646	72 29 38	2652	70 51 53	2657	69 14 16	2666
14	SUN W.	31 49 34	2482	33 21 13	2469	35 12 52	2469	36 54 31	2482

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
1	α Arietis	W.	94° 57' 45"	3168	96° 24' 33"	3173	97° 51' 14"	3178	99° 17' 50"	3184
	Aldebaran	W.	64 23 52	3069	65 52 39	3073	67 21 22	3077	68 50 0	3080
	SATURN	E.	34 39 10	3092	33 10 51	3096	31 42 39	3105	30 14 36	3111
	Spica	E.	70 34 33	3079	69 5 58	3085	67 37 28	3090	66 9 7	3085
	SUN	E.	117 43 35	3435	116 21 59	3441	115 0 28	3446	113 39 3	3450
2	Aldebaran	W.	76 12 15	3091	77 40 35	3099	79 8 54	3093	80 37 12	3093
	Pollux	W.	32 1 44	3109	33 29 51	3101	34 57 58	3100	36 26 7	3098
	SATURN	E.	22 56 20	3149	21 29 10	3158	20 2 10	3165	18 35 19	3174
	Spica	E.	58 48 26	3111	57 20 30	3113	55 52 36	3115	54 24 45	3117
	SUN	E.	106 52 56	3463	105 31 51	3464	104 10 47	3465	102 49 44	3465
3	Aldebaran	W.	87 58 55	3086	89 27 22	3083	90 55 52	3080	92 24 26	3076
	Pollux	W.	43 47 27	3087	45 15 53	3083	46 44 24	3079	48 12 59	3075
	Spica	E.	47 5 50	3119	45 38 4	3119	44 10 18	3118	42 42 31	3118
	SUN	E.	96 4 19	3458	94 43 8	3454	93 21 53	3451	92 0 35	3447
4	Aldebaran	W.	99 48 40	3049	101 17 52	3043	102 47 11	3036	104 16 39	3030
	Pollux	W.	55 37 31	3045	57 6 48	3039	58 36 13	3030	60 5 48	3029
	Regulus	W.	19 54 13	3156	21 21 20	3130	22 48 54	3110	24 16 52	3094
	Spica	E.	35 23 23	3114	33 55 31	3115	32 27 38	3116	30 59 45	3117
	SUN	E.	85 12 38	3418	83 50 42	3410	82 28 38	3402	81 6 24	3394
5	Pollux	W.	67 36 25	2976	69 7 8	2985	70 38 4	2985	72 9 15	2943
	Regulus	W.	31 41 41	3016	33 11 34	3009	34 41 46	2988	36 12 14	2973
	Spica	E.	23 41 7	3145	22 13 52	3161	20 46 56	3175	19 20 17	3191
	SUN	E.	74 12 41	3345	72 49 21	3333	71 25 48	3391	70 2 1	3309
6	Pollux	W.	79 48 54	2980	81 21 38	2987	82 54 40	2983	84 27 59	2939
	Regulus	W.	43 49 9	2991	45 21 27	2986	46 54 4	2971	48 27 1	2956
	SATURN	W.	25 17 53	2925	26 49 40	2909	28 21 48	2901	29 54 19	2874
	SUN	E.	62 59 24	3242	61 34 5	3228	60 8 26	3213	58 42 34	3198
7	Pollux	W.	92 19 16	2785	93 54 30	2750	95 30 4	2734	97 5 59	2718
	Regulus	W.	56 16 42	2778	57 51 41	2760	59 27 0	2744	61 2 41	2728
	SATURN	W.	37 42 20	2729	39 17 2	2779	40 52 6	2756	42 27 32	2739
	SUN	E.	51 28 22	3117	50 0 33	3100	48 32 23	3083	47 3 53	3066
8	Pollux	W.	105 10 49	2639	106 48 51	2623	108 27 16	2607	110 6 2	2591
	Regulus	W.	69 6 32	2646	70 44 24	2630	72 22 39	2614	74 1 17	2597
	SATURN	W.	50 30 21	2655	52 8 2	2638	53 46 7	2621	55 24 34	2604
	SUN	E.	39 36 6	2980	38 5 26	2963	36 34 27	2945	35 3 5	2928
9	Regulus	W.	82 20 0	2516	84 0 51	2501	85 42 4	2485	87 23 39	2470
	SATURN	W.	63 42 33	2521	65 23 17	2505	67 4 22	2489	68 45 50	2474
	SUN	E.	27 20 41	2642	25 47 7	2625	24 13 10	2609	22 38 52	2792
13	SUN	W.	25 3 24	2490	26 44 51	2487	28 26 23	2485	30 7 58	2483
	Fomalhaut	E.	47 48 9	2506	46 7 6	2525	44 26 28	2546	42 46 19	2579
	α Pegasi	E.	67 36 50	2676	65 59 38	2687	64 22 41	2701	62 46 3	2717
14	SUN	W.	38 36 10	2483	40 17 47	2485	41 59 22	2487	43 40 54	2489

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Fomalhaut E.	41° 6' 46"	9602	39° 27' 54"	9637	37° 49' 49"	9676	36° 12' 37"	9792
	α Pegasi E.	61 9 46	9737	59 33 55	9757	57 58 31	9782	56 23 39	9808
	α Arietis E.	102 21 37	9989	100 35 22	9988	98 49 5	9987	97 2 47	9986
15	Sun W.	45 22 23	9492	47 3 48	9495	48 45 9	9499	50 26 24	9502
	α Pegasi E.	48 39 35	3002	47 9 25	3056	45 40 21	3115	44 12 30	3180
	α Arietis E.	86 11 21	9294	86 25 13	9298	84 39 10	9302	82 53 13	9306
16	Sun W.	58 51 6	9598	60 31 40	9534	62 12 5	9540	63 52 22	9547
	α Aquilæ W.	40 44 48	4686	41 45 45	4598	42 49 10	4578	43 54 51	4644
	α Arietis E.	74 5 27	9339	72 20 21	9347	70 35 33	9356	68 50 55	9365
	Aldebaran E.	104 23 42	9298	102 35 56	9233	100 48 18	9239	99 0 49	9245
17	Sun W.	72 11 19	9585	73 50 35	9593	75 29 40	9601	77 8 35	9609
	α Aquilæ W.	49 50 57	3763	51 6 38	3695	52 23 30	3635	53 41 26	3582
	Jupiter W.	26 33 37	9367	26 17 59	9371	30 2 17	9376	31 46 30	9380
	α Arietis E.	60 11 27	9422	58 28 24	9436	56 45 41	9450	55 3 18	9466
	Aldebaran E.	90 5 43	9279	88 19 13	9286	86 32 54	9294	84 46 45	9302
18	Sun W.	85 20 13	9652	86 57 57	9661	88 35 29	9670	90 12 50	9679
	α Aquilæ W.	60 23 51	3395	61 46 20	3363	63 9 19	3340	64 32 44	3319
	Jupiter W.	40 25 35	9409	42 8 57	9416	43 52 8	9423	45 35 9	9431
	α Arietis E.	46 37 14	9559	44 57 22	9582	43 18 2	9607	41 3 16	9634
	Aldebaran E.	75 58 58	9243	74 14 1	9251	72 29 16	9260	70 44 43	9269
19	Sun W.	98 16 27	9795	99 52 34	9734	101 28 28	9743	103 4 11	9752
	α Aquilæ W.	71 34 50	3254	72 59 55	3247	74 25 12	3240	75 50 35	3235
	Jupiter W.	54 7 30	9470	55 49 25	9478	57 31 8	9486	59 12 39	9495
	Fomalhaut W.	36 22 22	9899	37 54 42	9869	39 27 41	9845	41 1 11	9894
	Mars W.	34 13 32	9668	35 50 55	9675	37 28 9	9682	39 5 14	9689
	Aldebaran E.	62 5 12	9413	60 21 56	9423	58 38 54	9432	56 56 5	9441
	Pollux E.	106 14 22	9402	104 30 50	9410	102 47 29	9419	101 4 21	9427
20	Sun W.	110 59 40	9799	112 34 9	9808	114 8 27	9817	115 42 32	9826
	α Aquilæ W.	82 58 1	3235	84 23 27	3240	85 48 48	3245	87 14 4	3252
	Jupiter W.	67 37 21	9537	69 17 43	9545	70 57 53	9553	72 37 51	9562
	Fomalhaut W.	48 54 3	9764	50 29 18	9759	52 4 42	9753	53 40 11	9750
	Mars W.	47 8 11	9736	48 44 16	9734	50 20 9	9742	51 55 52	9750
	α Pegasi W.	36 8 20	3905	37 21 35	3804	38 36 33	3715	39 53 4	3637
	Aldebaran E.	48 25 21	9489	46 43 53	9500	45 2 39	9511	43 21 41	9521
	Pollux E.	92 31 38	9470	90 49 42	9478	89 7 57	9487	87 26 24	9495
21	α Aquilæ W.	94 18 6	3300	95 42 18	3312	97 6 16	3326	98 29 57	3341
	Jupiter W.	80 54 48	9604	82 33 37	9612	84 12 14	9620	85 50 40	9629
	Fomalhaut W.	61 38 17	9748	63 13 53	9750	64 49 27	9759	66 24 57	9755
	Mars W.	59 51 44	9792	61 26 22	9800	63 0 49	9808	64 35 4	9817
	α Pegasi W.	46 33 25	3374	47 56 11	3337	49 19 40	3306	50 43 44	3279
	Aldebaran E.	35 0 32	9578	33 21 7	9590	31 42 0	9604	30 3 11	9619
	Pollux E.	79 1 35	9536	77 21 12	9544	75 41 1	9553	74 1 2	9561
	Regulus E.	115 5 31	9545	113 25 20	9553	111 45 20	9561	110 5 31	9569
22	Fomalhaut W.	74 21 17	9776	75 56 14	9784	77 31 4	9790	79 5 46	9796

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	Fomalhaut E.	34° 36' 27"	9779	33° 1' 32"	9842	31° 27' 58"	9917	29° 56' 0"	9907
	α Pegasi E.	54 49 22	9838	53 15 44	9872	51 42 49	9912	50 10 46	9954
	α Arietis E.	95 16 26	9987	93 30 8	9988	91 43 50	9989	89 57 34	9991
15	Sun W.	52 7 34	9507	53 48 38	9512	55 29 34	9517	57 10 24	9522
	α Pegasi E.	42 46 0	9855	41 20 56	9339	39 57 30	9435	38 35 53	9543
	α Arietis E.	81 7 22	9312	79 21 40	9318	77 36 7	9394	75 50 42	9331
16	Sun W.	65 32 29	9554	67 12 27	9561	68 52 14	9569	70 31 52	9577
	α Aquilæ W.	45 2 36	4194	46 12 15	4018	47 23 37	3992	48 36 34	3836
	α Arietis E.	67 6 31	9375	65 22 21	9386	63 38 26	9398	61 54 49	9410
	Aldebaran E.	97 13 28	9951	95 26 16	9958	93 39 15	9965	91 52 23	9979
17	Sun W.	78 47 18	9618	80 25 49	9626	82 4 9	9634	83 42 17	9643
	α Aquilæ W.	55 0 20	3534	56 20 7	3492	57 40 40	3453	59 1 57	3490
	Jupiter W.	33 30 35	9284	35 14 33	9290	36 58 23	9296	38 42 4	9402
	α Arietis E.	53 21 16	9489	51 39 38	9490	49 58 24	9517	48 17 35	9536
	Aldebaran E.	83 0 48	9310	81 15 3	9318	79 29 29	9396	77 44 8	9334
18	Sun W.	91 49 58	9689	93 26 53	9698	95 3 37	9707	96 40 8	9716
	α Aquilæ W.	65 56 33	3300	67 20 44	3387	68 45 11	3373	70 9 54	3364
	Jupiter W.	47 18 0	9439	49 0 39	9446	50 43 8	9453	52 25 24	9461
	α Arietis E.	40 1 7	9084	38 23 39	9097	36 46 55	9133	35 10 59	9173
	Aldebaran E.	69 0 23	9378	67 16 16	9386	65 32 22	9395	63 48 40	9404
19	Sun W.	104 39 41	9762	106 14 59	9771	107 50 4	9780	109 24 57	9789
	α Aquilæ W.	77 16 0	3233	78 41 30	3232	80 7 1	3239	81 32 32	3233
	Jupiter W.	60 53 59	9504	62 35 7	9512	64 16 3	9590	65 56 48	9596
	Fomalhaut W.	42 35 8	9807	44 9 27	9792	45 44 5	9781	47 18 58	9779
	Mars W.	40 42 10	9696	42 18 55	9703	43 55 31	9710	45 31 56	9718
	Aldebaran E.	55 13 29	9450	53 31 6	9460	51 48 57	9470	50 7 2	9479
	Pollux E.	99 21 24	9436	97 38 40	9444	95 56 8	9453	94 13 47	9461
20	Sun W.	117 16 26	9835	118 50 8	9844	120 23 38	9854	121 56 56	9863
	α Aquilæ W.	88 39 12	3259	90 4 11	3267	91 29 1	3277	92 53 39	3286
	Jupiter W.	74 17 38	9571	75 57 12	9579	77 36 36	9587	79 15 47	9595
	Fomalhaut W.	55 15 45	9747	56 51 22	9747	58 27 0	9746	60 2 39	9747
	Mars W.	53 31 24	9759	55 6 46	9767	56 41 56	9775	58 16 56	9783
	α Pegasi W.	41 10 58	3569	42 30 5	3511	43 50 17	3459	45 11 26	3414
	Aldebaran E.	41 40 56	9539	40 0 27	9542	38 20 13	9553	36 40 14	9565
	Pollux E.	85 45 2	9503	84 3 53	9511	82 22 55	9590	80 42 9	9596
21	α Aquilæ W.	99 53 21	3358	101 16 27	3375	102 39 12	3394	104 1 35	3414
	Jupiter W.	87 28 55	9638	89 6 58	9646	90 44 49	9654	92 22 30	9663
	Fomalhaut W.	68 0 24	9759	69 35 45	9763	71 11 2	9767	72 46 13	9772
	Mars W.	66 9 9	9896	67 43 3	9835	69 16 46	9843	70 50 18	9852
	α Pegasi W.	52 8 20	3255	53 33 24	3234	54 58 53	3216	56 24 43	3200
	Aldebaran E.	28 24 42	9636	26 46 36	9653	25 8 52	9679	23 31 35	9699
	Pollux E.	72 21 14	9570	70 41 38	9578	69 2 13	9587	67 23 0	9595
	Regulus E.	108 25 53	9577	106 46 26	9585	105 7 10	9593	103 28 4	9601
22	Fomalhaut W.	80 40 20	9802	82 14 45	9809	83 49 1	9816	85 23 8	9823

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	α Pegasi	W.	57° 50' 52"	3186	59° 17' 18"	3174	60° 43' 58"	3163	62° 10' 50"	3154
	Pollux	E.	65 43 59	2604	64 5 9	2619	62 26 31	2621	60 48 5	2629
	Regulus	E.	101 49 10	2608	100 10 26	2616	98 31 54	2625	96 53 33	2633
23	Fomalhaut	W.	86 57 5	2831	88 30 52	2839	90 4 28	2848	91 37 54	2857
	α Pegasi	W.	69 27 4	3135	70 54 31	3133	72 22 0	3133	73 49 28	3133
	α Arietis	W.	25 56 55	3313	27 20 51	3254	28 45 56	3206	30 11 59	3166
	Pollux	E.	52 38 48	2674	51 1 33	2683	49 24 29	2692	47 47 38	2700
	Regulus	E.	88 44 32	2675	87 7 18	2684	85 30 15	2692	83 53 23	2700
24	Fomalhaut	W.	99 22 7	2905	100 54 20	2915	102 26 20	2926	103 58 7	2937
	α Pegasi	W.	81 6 16	3152	82 33 23	3157	84 0 24	3163	85 27 18	3170
	α Arietis	W.	37 31 58	3046	39 1 15	3033	40 30 47	3022	42 0 32	3014
	Pollux	E.	39 46 26	2748	38 10 50	2758	36 35 27	2768	35 0 17	2779
	Regulus	E.	75 51 54	2742	74 16 10	2751	72 40 38	2760	71 5 18	2769
25	α Pegasi	W.	92 39 34	3211	94 5 30	3221	95 31 13	3232	96 56 44	3244
	α Arietis	W.	49 31 6	2997	51 1 23	2997	52 31 40	2997	54 1 56	2999
	Pollux	E.	27 8 6	2639	25 34 30	2651	24 1 9	2666	22 28 4	2684
	Regulus	E.	63 11 32	2614	61 37 22	2623	60 3 24	2632	58 29 38	2641
26	α Arietis	W.	61 32 35	3015	63 2 29	3019	64 32 18	3023	66 2 2	3028
	Aldebaran	W.	30 14 32	2924	31 46 20	2928	33 18 3	2932	34 49 41	2937
	Regulus	E.	50 43 48	2689	49 11 15	2698	47 38 53	2706	46 6 45	2718
	Spica	E.	104 46 38	2893	103 14 10	2901	101 41 51	2909	100 9 43	2917
27	α Arietis	W.	73 29 0	3057	74 58 2	3063	76 26 57	3069	77 55 44	3075
	Aldebaran	W.	42 26 13	2965	43 57 10	2971	45 27 59	2977	46 58 40	2983
	Regulus	E.	38 29 10	2668	36 58 17	2679	35 27 38	2690	33 57 13	2702
	Spica	E.	92 31 36	2957	91 0 29	2965	89 29 32	2973	87 58 45	2981
28	α Arietis	W.	85 17 42	3106	86 45 42	3114	88 13 34	3120	89 41 19	3126
	Aldebaran	W.	54 30 8	3014	56 0 3	3020	57 29 50	3026	58 59 30	3032
	Regulus	E.	26 28 46	2667	24 59 56	2682	23 31 24	2696	22 3 12	2718
	Spica	E.	80 27 11	3018	78 57 20	3025	77 27 37	3032	75 58 4	3039
29	Aldebaran	W.	66 26 8	3059	67 55 8	3063	69 24 2	3068	70 52 51	3071
	Pollux	W.	22 19 8	3094	23 47 25	3093	25 15 43	3092	26 44 3	3091
	Spica	E.	68 32 15	3069	67 3 28	3075	65 34 48	3081	64 6 14	3085
	VENUS	E.	110 20 3	3117	108 52 14	3123	107 24 30	3129	105 56 55	3135
30	Aldebaran	W.	78 15 51	3088	79 44 15	3090	81 12 36	3093	82 40 55	3095
	Pollux	W.	34 5 29	3096	35 33 43	3097	37 1 56	3098	38 30 8	3099
	Spica	E.	56 44 57	3109	55 16 58	3113	53 49 3	3116	52 21 12	3119
	VENUS	E.	98 40 41	3161	97 13 45	3165	95 46 54	3169	94 20 8	3173
	SUN	E.	132 39 21	3466	131 18 19	3469	129 57 20	3471	128 36 24	3473
31	Aldebaran	W.	90 2 7	3097	91 30 20	3096	92 58 34	3095	94 26 49	3095
	Pollux	W.	45 51 7	3096	47 19 21	3095	48 47 36	3094	50 15 53	3093
	Spica	E.	45 2 57	3133	43 35 28	3136	42 8 1	3138	40 40 37	3141
	VENUS	E.	87 7 15	3185	85 40 48	3187	84 14 23	3187	82 47 58	3186
	SUN	E.	121 52 4	3476	120 31 13	3475	119 10 21	3474	117 49 29	3473

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	α Pegasi W.	63 37 51	3148	65 5 1	3143	66 32 17	3139	67 59 39	3137
	Pollux E.	59 9 50	2638	57 31 47	2647	55 53 56	2656	54 16 16	2665
	Regulus E.	95.15 23	2641	93 37 23	2649	91 59 35	2657	90 21 58	2666
23	Fomalhaut W.	93 11 8	2886	94 44 11	2875	96 17 2	2885	97 49 41	2895
	α Pegasi W.	75 16 57	3135	76 44 22	3139	78 11 44	3143	79 39 2	3146
	α Arietis W.	31 38 49	3130	33 6 22	3102	34 34 28	3080	36 3 2	3068
	Pollux E.	46 10 58	2710	44 34 31	2719	42 58 17	2729	41 22 15	2737
	Regulus E.	82 16 42	2708	80 40 13	2716	79 3 55	2724	77 27 49	2733
24	Fomalhaut W.	105 29 39	2948	107 0 57	2960	108 32 0	2973	110 2 47	2985
	α Pegasi W.	86 54 5	3177	88 20 42	3185	89 47 9	3193	91 13 27	3202
	α Arietis W.	43 30 27	3009	45 0 29	3003	46 30 38	3000	48 0 51	2998
	Pollux E.	33 25 22	2790	31 50 41	2801	30 16 14	2812	28 42 2	2825
	Regulus E.	69 30 9	2778	67 55 12	2787	66 20 27	2796	64 45 53	2805
25	α Pegasi W.	98 22 1	3256	99 47 4	3269	101 11 52	3282	102 36 25	3296
	α Arietis W.	55 32 10	3001	57 2 22	3003	58 32 31	3006	60 2 35	3010
	Pollux E.	20 55 22	2904	19 23 8	2924	17 51 20	2944	16 19 57	2965
	Regulus E.	56 56 4	2850	55 22 41	2859	53 49 31	2869	52 16 34	2879
26	α Arietis W.	67 31 39	3034	69 1 10	3039	70 30 34	3045	71 59 51	3051
	Aldebaran W.	36 21 13	2942	37 52 38	2947	39 23 57	2953	40 55 8	2959
	Regulus E.	44 34 48	2928	43 3 5	2938	41 31 34	2948	40 0 15	2958
	Spica E.	98 37 45	2924	97 5 57	2932	95 34 20	2941	94 2 53	2949
27	α Arietis W.	79 24 23	3069	80 52 55	3082	82 21 18	3095	83 49 34	3101
	Aldebaran W.	48 29 13	2989	49 59 39	2995	51 29 56	3001	53 0 6	3007
	Regulus E.	32 27 1	3014	30 57 5	3025	29 27 23	3037	27 57 56	3052
	Spica E.	86 28 7	2969	84 57 40	2997	83 27 21	3004	81 57 11	3011
28	α Arietis W.	91 8 55	3133	92 36 24	3139	94 3 45	3145	95 31 0	3152
	Aldebaran W.	60 29 3	3038	61 58 29	3045	63 27 48	3051	64 57 1	3055
	Regulus E.	20 35 26	3142	19 8 11	3168	17 41 28	3194	16 15 16	3220
	Spica E.	74 28 38	3045	72 59 21	3051	71 30 11	3057	70 1 10	3063
29	Aldebaran W.	72 21 36	3075	73 50 16	3079	75 18 51	3082	76 47 23	3085
	Pollux W.	28 12 23	3092	29 40 41	3093	31 8 58	3094	32 37 15	3095
	Spica E.	62 37 47	3091	61 9 26	3096	59 41 11	3101	58 13 1	3105
	VENUS E.	104 29 26	3141	103 2 4	3146	101 34 50	3151	100 7 43	3156
30	Aldebaran W.	84 9 12	3086	85 37 28	3097	87 5 41	3097	88 33 54	3097
	Pollux W.	39 58 20	3099	41 26 31	3099	42 54 43	3098	44 22 54	3097
	Spica E.	50 53 26	3122	49 25 44	3125	47 58 5	3126	46 30 30	3131
	VENUS E.	92 53 27	3176	91 26 49	3179	90 0 15	3181	88 33 43	3183
	SUN E.	127 15 30	3474	125 54 37	3475	124 33 45	3476	123 12 54	3476
31	Aldebaran W.	95 55 5	3093	97 23 24	3091	98 51 45	3088	100 20 10	3085
	Pollux W.	51 44 13	3089	53 12 36	3086	54 41 2	3083	56 9 32	3080
	Spica E.	39 13 16	3143	37 45 58	3146	36 18 42	3148	34 51 29	3151
	VENUS E.	81 21 32	3186	79 55 6	3186	78 28 41	3187	77 2 16	3186
	SUN E.	116 28 34	3471	115 7 37	3469	113 46 38	3466	112 25 35	3468

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1 19 49 56.32	+16.839	-23 9 24.2	+50.21	1 5.7	1	20 31 44.88	-11.586	-15 7 38.2	-42.15	23 36.9	
2 19 56 37.90	16.691	22 48 35.0	53.87	1 8.5	2	20 27 17.28	10.679	15 24 48.8	43.52	23 28.9	
3 20 3 13.79	16.364	22 26 19.5	57.40	1 11.1	3	20 23 14.18	9.554	15 42 19.3	43.90	23 21.5	
4 20 9 43.02	16.064	22 2 41.0	60.78	1 13.6	4	20 19 39.86	8.968	15 59 48.7	43.42	23 14.6	
5 20 16 4.48	15.716	21 37 43.5	63.97	1 16.0	5	20 16 37.25	6.990	16 16 58.1	42.25	23 8.1	
6 20 22 16.94	+15.313	-21 11 32.2	+66.93	1 18.3	6	20 14 8.09	-5.505	-16 33 32.4	-40.53	23 2.2	
7 20 28 19.01	14.848	20 44 13.3	69.60	1 20.4	7	20 12 13.09	4.079	16 49 19.9	38.36	22 56.9	
8 20 34 9.09	14.313	20 15 54.4	71.92	1 22.3	8	20 10 52.17	2.672	17 4 11.1	35.66	22 52.2	
9 20 39 45.41	13.700	19 46 44.7	73.84	1 24.0	9	20 10 4.52	1.306	17 17 59.2	33.11	22 48.0	
10 20 45 5.98	12.999	19 16 54.9	75.96	1 25.3	10	20 9 48.89	-0.006	17 30 38.6	30.15	22 44.3	
11 20 50 8.57	+12.201	-18 46 37.4	+76.11	1 26.4	11	20 10 3.69	+1.297	-17 42 5.4	-27.06	22 41.0	
12 20 54 50.77	11.297	18 16 6.8	76.39	1 27.2	12	20 10 47.17	2.399	17 52 16.6	23.66	22 38.2	
13 20 59 9.92	10.378	17 45 39.8	75.80	1 27.5	13	20 11 57.42	3.459	18 1 10.2	20.59	22 35.8	
14 21 3 3.15	9.137	17 15 35.0	74.46	1 27.4	14	20 13 32.57	4.457	18 8 44.6	17.26	22 33.8	
15 21 6 27.46	7.667	16 46 13.0	72.91	1 26.9	15	20 15 30.76	5.378	18 14 58.4	13.89	22 32.2	
16 21 9 19.74	+6.467	-16 17 56.6	+68.99	1 25.8	16	20 17 50.15	+6.227	-18 19 51.1	-10.49	22 30.9	
17 21 11 36.87	4.938	15 51 9.6	64.75	1 24.1	17	20 20 29.06	7.005	18 23 21.9	7.07	22 29.9	
18 21 13 15.84	3.390	15 26 16.9	59.46	1 21.7	18	20 23 25.87	7.718	18 25 30.5	3.64	22 29.1	
19 21 14 13.94	+1.536	15 3 43.6	53.14	1 18.7	19	20 26 39.06	8.372	18 26 16.7	-0.91	22 28.6	
20 21 14 28.92	-0.999	14 43 54.1	45.63	1 15.0	20	20 30 7.30	8.971	18 25 40.5	+3.23	22 28.4	
21 21 13 59.24	-2.181	-14 27 10.7	+37.66	1 10.5	21	20 33 49.27	+9.518	-18 23 41.9	+6.67	22 28.4	
22 21 12 44.25	4.066	14 13 52.1	28.79	1 5.3	22	20 37 43.80	10.019	18 20 20.7	10.10	22 28.5	
23 21 10 44.48	5.902	14 4 12.8	19.42	0 59.4	23	20 41 49.84	10.479	18 15 37.2	13.52	22 28.8	
24 21 8 1.83	7.639	13 58 21.5	9.84	0 52.7	24	20 46 6.41	10.897	18 9 31.6	16.94	22 29.3	
25 21 4 39.66	9.184	13 56 19.6	+0.36	0 45.4	25	20 50 32.63	11.999	18 2 4.1	20.35	22 29.9	
26 21 0 42.84	-10.506	-13 58 1.1	-8.72	0 37.6	26	20 55 7.70	+11.635	-17 53 14.9	+23.75	22 30.7	
27 20 56 17.65	11.540	14 3 12.9	17.12	0 29.3	27	20 59 50.89	11.958	17 43 4.1	27.14	22 31.6	
28 20 51 31.56	12.943	14 11 35.2	24.55	0 20.6	28	21 4 41.50	12.956	17 31 32.3	30.51	22 32.6	
29 20 46 32.80	12.593	14 22 42.3	30.85	0 11.7	29	21 9 38.98	12.531	17 18 39.7	33.87	22 33.7	
30 20 41 29.92	12.586	14 36 5.8	35.88	0 2.0	30	21 14 42.80	12.785	17 4 26.6	37.22	22 34.9	
31 20 36 31.35	-12.239	-14 51 14.4	-30.63	23 45.3	31	21 19 52.47	+13.018	-16 48 53.4	+40.55	22 36.2	
32 20 31 44.88	-11.586	-15 7 38.2	-42.15	23 36.9	32	21 25 7.54	+13.235	-16 32 0.3	+43.87	22 37.6	

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter . .	26	29	32	37	43	49	51	Semidiameter.	49	45	41	37	34
Hor. Parallax . .	7.0	7.6	8.5	9.7	11.3	12.9	13.5	Hor. Parallax	13.0	11.9	10.8	9.8	9.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	21 9 38.98	+12.531	-17 18 39.7	+ 33.87	22 33.7	1	0 16 21.91	+17.301	- 0 10 28.5	+127.36	23 40.2
2	21 14 42.80	12.785	17 4 26.6	37.22	22 34.9	2	0 23 19.33	17.485	+ 0 40 55.0	129.57	23 43.2
3	21 19 52.47	13.018	16 48 53.4	40.55	22 36.2	3	0 30 21.23	17.674	1 33 9.8	131.84	23 46.4
4	21 25 7.54	13.225	16 32 0.3	43.87	22 37.6	4	0 37 27.72	17.867	2 26 12.3	133.54	23 49.7
5	21 30 27.63	13.426	16 13 47.8	47.17	22 39.1	5	0 44 38.88	18.063	3 19 58.2	135.25	23 53.0
6	21 35 52.40	+13.625	-15 54 16.1	+ 50.46	22 40.6	6	0 51 54.75	+18.259	+ 4 14 22.4	+136.75	23 56.4
7	21 41 21.53	13.801	15 33 25.7	53.73	22 42.2	7	0 59 15.31	18.454	5 9 19.2	137.97	23 59.9
8	21 46 54.75	13.968	15 11 17.0	56.98	22 43.9	8	1 6 40.50	18.644	6 4 41.9	138.99	
9	21 52 31.83	14.122	14 47 50.6	60.22	22 45.6	9	1 14 10.18	18.836	7 0 23.1	139.49	0 3.5
10	21 58 12.54	14.269	14 23 6.6	63.44	22 47.5	10	1 21 44.13	19.030	7 56 14.3	139.72	0 7.1
11	22 3 56.71	+14.410	-13 57 5.4	+ 66.65	22 49.3	11	1 29 22.05	+19.156	+ 8 52 6.2	+139.54	0 10.8
12	22 9 44.19	14.545	13 29 47.5	69.83	22 51.2	12	1 37 3.48	19.353	9 47 48.5	139.91	0 14.5
13	22 15 34.85	14.675	13 1 13.5	73.00	22 53.2	13	1 44 47.92	19.495	10 43 10.1	137.81	0 18.3
14	22 21 28.58	14.802	12 31 23.8	76.14	22 55.2	14	1 52 34.75	19.498	11 37 59.2	136.90	0 22.2
15	22 27 25.30	14.925	12 0 18.8	79.27	22 57.2	15	2 0 23.07	19.536	12 32 3.3	134.66	0 26.1
16	22 33 24.96	+15.046	-11 27 58.9	+ 82.38	22 59.3	16	2 8 12.13	+19.545	+13 25 9.8	+131.30	0 30.0
17	22 39 27.51	15.168	10 54 24.8	85.46	23 1.5	17	2 16 0.90	19.511	14 17 5.6	128.18	0 33.8
18	22 45 32.94	15.286	10 19 36.9	88.52	23 3.7	18	2 23 48.27	19.430	15 7 38.1	124.45	0 37.7
19	22 51 41.25	15.406	9 43 35.8	91.56	23 5.9	19	2 31 33.13	19.300	15 56 35.1	120.22	0 41.5
20	22 57 52.46	15.528	9 6 22.0	94.58	23 8.2	20	2 39 14.26	19.119	16 43 45.3	115.85	0 45.3
21	23 4 6.60	+15.651	- 8 27 56.2	+ 97.56	23 10.6	21	2 46 50.43	+18.887	+17 28 58.2	+110.47	0 49.0
22	23 10 23.74	15.778	7 48 19.2	100.53	23 13.0	22	2 54 20.42	18.604	18 12 5.0	106.04	0 52.5
23	23 16 43.94	15.906	7 7 31.7	103.44	23 15.4	23	3 1 43.04	18.272	18 52 57.7	99.31	0 55.9
24	23 23 7.28	16.030	6 25 34.5	106.32	23 17.9	24	3 8 57.10	17.889	19 31 30.1	92.35	0 59.2
25	23 29 33.87	16.177	5 42 28.5	109.17	23 20.5	25	3 16 1.48	17.466	20 7 37.3	87.23	1 2.4
26	23 36 3.83	+16.300	- 4 58 14.7	+111.97	23 23.1	26	3 22 55.14	+16.999	+20 41 16.2	+ 81.00	1 5.4
27	23 42 37.28	16.468	4 12 54.3	114.72	23 25.8	27	3 29 37.10	16.492	21 12 24.7	74.70	1 8.1
28	23 49 14.37	16.623	3 26 28.7	117.41	23 27.5	28	3 36 6.43	15.947	21 41 1.9	66.40	1 10.6
29	23 55 55.22	16.783	2 38 59.4	120.03	23 31.3	29	3 42 22.28	15.368	22 7 8.0	62.19	1 12.9
30	0 2 39.99	16.942	1 50 28.1	122.56	23 34.2	30	3 48 23.83	14.756	22 30 44.0	55.20	1 15.0
31	0 9 28.84	+17.122	- 1 0 57.1	+125.01	23 37.2	31	3 54 10.35	+14.116	+22 51 51.9	+ 46.77	1 16.8
32	0 16 21.91	+17.301	- 0 10 28.5	+127.36	23 40.2	32	3 59 41.16	+13.447	+23 10 34.0	+ 42.75	1 18.4
Day of the Month.						Day of the Month.					
2d.	7th.	12th.	17th.	22d.	27th.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	3.2	3.0	2.8	2.7	2.6	2.5	2.5	2.5	2.6	2.8	3.1
Hor. Parallax . .	8.4	7.9	7.5	7.2	6.9	6.7	6.6	6.6	6.7	7.0	8.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1 3 54 10.35	+14.116	+22 51 51.9	+49.77	1 16.8		1 4 24 33.70	- 5.909	+18 49 3.8	-48.59	23 39.0	
2 3 59 41.16	13.447	23 10 34.0	43.75	1 18.4		2 4 22 31.57	4.954	18 30 10.4	45.77	23 33.1	
3 4 4 55.58	12.751	23 26 52.8	37.84	1 19.7		3 4 20 36.58	4.615	18 12 30.8	42.45	23 27.4	
4 4 9 53.01	12.031	23 40 51.5	32.07	1 20.7		4 4 18 50.64	4.201	17 56 16.4	38.68	23 21.9	
5 4 14 32.89	11.288	23 52 33.3	26.44	1 21.4		5 4 17 15.48	3.719	17 41 37.2	34.53	23 16.6	
6 4 18 54.65	+10.522	+24 2 1.8	+20.95	1 21.8		6 4 15 52.65	- 3.177	+17 28 41.4	-30.07	23 11.6	
7 4 22 57.78	9.735	24 9 20.2	15.61	1 21.8		7 4 14 43.46	2.583	17 17 35.7	25.36	23 6.7	
8 4 26 41.80	8.930	24 14 32.1	10.40	1 21.6		8 4 13 49.02	1.947	17 8 25.5	20.47	23 2.1	
9 4 30 6.27	8.106	24 17 40.6	5.33	1 21.1		9 4 13 10.28	1.276	17 1 14.1	15.46	22 57.8	
10 4 33 10.77	7.286	24 18 49.2	+ 0.41	1 20.2		10 4 12 47.96	- 0.578	16 56 3.6	10.40	22 53.8	
11 4 35 54.93	+ 6.412	+24 18 1.1	- 4.39	1 19.0		11 4 12 42.70	+ 0.141	+16 52 54.6	- 5.35	22 50.0	
12 4 38 18.47	5.548	24 15 19.5	9.05	1 17.4		12 4 12 54.87	0.875	16 51 46.2	- 0.36	22 46.6	
13 4 40 21.14	4.674	24 10 47.6	13.58	1 15.5		13 4 13 24.80	1.690	16 52 36.4	+ 4.52	22 43.4	
14 4 42 2.79	3.797	24 4 28.6	17.98	1 13.2		14 4 14 12.68	2.371	16 55 22.2	9.27	22 40.6	
15 4 43 23.39	2.920	23 56 25.8	22.23	1 10.6		15 4 15 18.62	3.125	16 59 59.9	13.84	22 38.0	
16 4 44 22.97	+ 2.048	+23 46 42.7	-26.33	1 7.6		16 4 16 42.67	+ 3.879	+17 6 24.7	+18.19	22 35.8	
17 4 45 1.76	1.188	23 35 23.1	30.27	1 4.3		17 4 18 24.81	4.632	17 14 31.2	22.31	22 33.8	
18 4 45 20.10	+ 0.344	23 22 31.1	34.03	1 0.7		18 4 20 24.99	5.382	17 24 13.8	26.18	22 32.2	
19 4 45 18.47	- 0.475	23 8 11.1	37.59	0 56.9		19 4 22 43.13	6.129	17 35 26.0	29.79	22 30.8	
20 4 44 57.60	1.268	22 52 28.4	40.91	0 52.4		20 4 25 19.15	6.872	17 48 1.4	33.11	22 29.7	
21 4 44 18.42	- 2.000	+22 35 29.4	-43.96	0 47.8		21 4 28 12.96	+ 7.612	+18 1 52.8	+36.13	22 29.0	
22 4 43 22.02	2.091	22 17 20.6	46.71	0 43.0		22 4 31 24.48	8.348	18 16 53.1	38.84	22 28.5	
23 4 42 9.72	3.323	21 58 9.9	49.12	0 37.8		23 4 34 53.64	9.082	18 32 54.6	41.22	22 28.3	
24 4 40 43.08	3.885	21 38 6.3	51.12	0 32.4		24 4 38 40.37	9.812	18 49 49.6	43.29	22 28.4	
25 4 39 3.85	4.371	21 17 19.8	52.62	0 26.9		25 4 42 44.62	10.542	19 7 30.0	45.02	22 28.8	
26 4 37 13.95	- 4.773	+20 56 1.4	-53.76	0 21.1		26 4 47 6.36	+11.970	+19 25 47.6	+46.40	22 29.5	
27 4 35 15.47	5.085	20 34 23.4	54.32	0 15.2		27 4 51 45.57	11.998	19 44 33.9	47.40	22 30.5	
28 4 33 10.60	5.304	20 12 38.3	54.33	0 9.2		28 4 56 42.24	12.725	20 3 39.7	48.02	22 31.8	
29 4 31 1.65	5.425	19 51 0.0	53.77	0 3.2		29 5 1 56.36	13.452	20 22 55.9	48.26	22 33.4	
30 4 28 50.97	5.448	19 29 42.0	52.63	23 51.0		30 5 7 27.93	14.178	20 42 13.0	48.02	22 35.2	
31 4 26 40.89	- 5.375	+19 8 58.6	-50.89	23 45.0		31 5 13 16.91	+14.903	+21 1 20.8	+47.42	22 37.3	
32 4 24 33.70	- 5.209	+18 49 3.8	-48.59	23 39.0		32 5 19 23.25	+15.624	+21 20 9.0	+46.45	22 39.8	
Day of the Month.						Day of the Month.					
1st. 6th. 11th. 16th. 21st. 26th. 31st.						5th. 10th. 15th. 20th. 25th. 30th.					
Semidiameter . . 3.5 4.0 4.8 5.1 5.6 6.0 6.1						Semidiameter . . 5.9 5.4 4.9 4.4 3.9 3.4					
Hor. Parallax . . 9.2 10.5 11.9 13.5 14.9 15.8 16.1						Hor. Parallax . . 15.6 14.4 13.0 11.6 10.3 9.1					

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.									
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.				
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.					
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m				
1	5 13 16.91	+14.903	+21 1 20.8	+47.49	22 37.3	1	9 29 8.48	+18.742	+16 38 40.2	-96.16	0 49.1				
2	5 19 23.25	15.694	21 20 9.0	46.45	22 39.8	2	9 36 33.41	18.337	15 59 45.7	96.33	0 52.6				
3	5 25 46.66	16.340	21 38 26.9	44.95	22 42.5	3	9 43 48.70	17.930	15 20 2.4	100.23	0 55.9				
4	3 32 27.56	17.049	21 56 3.0	42.97	22 45.5	4	9 50 54.54	17.549	14 39 36.6	101.87	0 59.0				
5	5 39 25.15	17.746	22 12 45.8	40.51	22 48.8	5	9 57 51.14	17.160	13 58 34.3	103.97	1 2.0				
6	5 46 39.26	+18.437	+22 28 23.4	+37.54	22 52.4	6	10 4 38.72	+16.798	+13 17 1.3	-104.44	1 4.9				
7	5 54 9.46	19.086	22 42 43.7	34.06	22 56.2	7	10 11 17.53	16.438	12 35 2.6	106.41	1 7.6				
8	6 1 55.16	19.717	22 55 34.5	30.08	23 0.2	8	10 17 47.81	16.067	11 52 43.0	108.19	1 10.1				
9	6 9 55.61	20.314	23 6 44.0	25.60	23 4.6	9	10 24 9.80	15.746	11 10 7.0	109.78	1 12.5				
10	6 18 9.89	20.868	23 16 0.0	20.65	23 9.1	10	10 30 23.72	15.415	10 27 19.0	107.90	1 14.8				
11	6 26 36.91	+21.374	+23 23 11.7	+15.25	23 13.8	11	10 36 29.82	+15.094	+ 9 44 22.7	-107.46	1 17.0				
12	6 35 15.42	21.894	23 28 8.7	9.44	23 18.7	12	10 42 28.34	14.788	9 1 22.0	107.57	1 19.0				
13	6 44 3.97	22.211	23 30 42.0	+ 3.28	23 23.7	13	10 48 19.44	14.478	8 18 20.7	107.53	1 20.9				
14	6 53 0.99	22.598	23 30 43.8	- 3.17	23 28.8	14	10 54 3.33	14.168	7 35 21.7	107.36	1 22.7				
15	7 2 4.77	22.773	23 28 8.1	9.83	23 34.0	15	10 59 40.21	13.899	6 52 28.3	107.06	1 24.4				
16	7 11 13.54	+22.944	+23 22 50.7	-16.63	23 39.3	16	11 5 10.21	+13.609	+ 6 9 43.7	-106.63	1 26.0				
17	7 20 25.50	23.040	23 14 49.4	23.48	23 44.6	17	11 10 33.48	13.331	5 27 10.8	106.09	1 27.4				
18	7 29 34.85	23.000	23 4 4.1	30.39	23 49.9	18	11 15 50.13	13.057	4 44 52.3	105.42	1 28.7				
19	7 38 51.83	23.009	22 50 36.3	37.00	23 55.2	19	11 21 0.25	12.787	4 2 51.3	104.64	1 29.9				
20	7 48 2.80	22.893	22 34 29.4	43.53		20	11 26 3.91	12.519	3 21 10.5	103.74	1 31.0				
21	7 57 10.23	+22.716	+22 15 48.5	-49.89	0 0.4	21	11 31 1.17	+12.253	+ 2 39 52.5	-102.74	1 32.0				
22	8 6 12.76	22.498	21 54 40.1	55.89	0 5.5	22	11 35 52.05	11.987	1 59 0.1	101.61	1 32.9				
23	8 15 9.19	22.910	21 31 11.6	61.50	0 10.5	23	11 40 36.55	11.781	1 18 36.0	100.37	1 33.7				
24	8 23 58.51	21.895	21 5 31.0	66.89	0 15.4	24	11 45 14.62	11.452	+ 0 38 43.1	99.02	1 34.4				
25	8 32 39.88	21.548	20 37 47.2	71.77	0 20.2	25	11 49 46.21	11.180	- 0 0 35.8	97.54	1 35.0				
26	8 41 12.62	+21.177	+20 8 9.3	-76.34	0 24.8	26	11 54 11.22	+10.903	- 0 39 17.7	-95.94	1 35.5				
27	8 49 36.22	20.788	19 36 46.0	80.53	0 29.2	27	11 58 29.51	10.680	1 17 19.7	94.91	1 35.8				
28	8 57 50.33	20.368	19 3 46.8	84.35	0 33.5	28	12 2 40.92	10.330	1 54 38.5	92.34	1 36.1				
29	9 5 54.70	19.977	18 29 20.3	87.80	0 37.6	29	12 6 45.96	10.030	2 31 10.7	90.32	1 36.2				
30	9 13 49.19	19.564	17 53 35.0	90.91	0 41.6	30	12 10 42.27	9.718	3 6 52.9	88.16	1 36.2				
31	9 21 33.78	+19.159	+17 16 39.1	-93.89	0 45.4	31	12 14 31.64	+ 9.393	- 3 41 41.2	-85.84	1 36.1				
32	9 29 8.48	+18.742	+16 38 40.2	-96.16	0 49.1	32	12 18 13.03	+ 9.053	- 4 15 31.6	-83.34	1 35.8				
Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.		4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .		3.1	2.8	2.6	2.5	2.5	2.5	Semidiameter . .		2.6	2.6	2.7	2.9	3.1	3.3
Hor. Parallax . .		8.2	7.5	7.0	6.7	6.6	6.6	Hor. Parallax . .		6.8	7.0	7.3	7.7	8.1	8.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	12 18 13.03	+9.053	-4 15 31.6	-83.34	1 35.8	1	12 14 16.74	-8.440	-3 34 23.2	+108.51	23 26.6
2	12 21 46.07	8.696	4 48 19.8	80.65	1 35.4	2	12 11 3.43	7.630	2 51 37.3	104.88	23 19.8
3	12 25 10.29	8.319	5 20 1.0	77.75	1 34.9	3	12 8 12.25	6.599	2 10 48.4	98.78	23 13.5
4	12 28 25.19	7.919	5 50 30.2	74.63	1 34.2	4	12 5 48.20	5.375	1 32 53.7	90.42	23 7.7
5	12 31 30.17	7.493	6 19 41.8	71.98	1 33.3	5	12 3 55.47	3.998	0 58 43.8	80.19	23 2.4
6	12 34 24.61	+7.038	-6 47 29.7	-67.66	1 32.2	6	12 2 37.18	-2.512	-0 29 0.2	+ 68.30	22 57.8
7	12 37 7.77	6.558	7 13 47.1	63.75	1 31.0	7	12 1 55.43	-0.960	-0 4 14.5	55.36	22 53.7
8	12 39 38.86	6.038	7 38 26.8	59.52	1 29.6	8	12 1 51.29	+0.615	+0 15 11.6	41.74	22 50.3
9	12 41 57.03	5.475	8 1 21.0	54.94	1 27.9	9	12 2 24.82	2.174	0 29 6.6	27.63	22 47.6
10	12 44 1.32	4.876	8 22 20.7	49.98	1 26.0	10	12 3 35.27	3.685	0 37 28.0	13.98	22 45.4
11	12 45 50.73	+4.233	-8 41 16.4	-44.60	1 23.9	11	12 5 21.13	+5.122	+0 40 20.6	+ 0.40	22 43.7
12	12 47 24.15	3.544	8 57 57.8	38.76	1 21.5	12	12 7 40.37	6.464	0 37 56.0	-12.42	22 42.6
13	12 48 40.47	2.806	9 12 13.2	32.44	1 18.8	13	12 10 30.54	7.698	0 30 30.5	24.56	22 41.9
14	12 49 38.46	2.018	9 23 50.8	25.60	1 15.8	14	12 13 48.95	8.816	0 16 24.2	35.81	22 41.7
15	12 50 16.96	1.180	9 32 37.5	18.19	1 12.5	15	12 17 32.78	9.817	+0 1 59.5	46.08	22 41.8
16	12 50 34.75	+0.294	-9 38 19.3	-10.90	1 8.8	16	12 21 39.22	+10.701	-0 18 19.5	-55.34	22 42.3
17	12 50 30.72	-0.637	9 40 42.1	-1.60	1 4.8	17	12 26 5.53	11.473	0 42 8.5	63.58	22 43.1
18	12 50 3.83	1.608	9 39 31.5	+7.58	1 0.4	18	12 30 49.11	12.141	1 9 3.4	70.83	22 44.1
19	12 49 13.28	2.609	9 34 33.7	17.33	0 55.7	19	12 35 47.55	12.715	1 38 40.8	77.13	22 45.3
20	12 47 58.48	3.696	9 25 35.6	27.59	0 50.5	20	12 40 58.67	13.901	2 10 38.3	88.58	22 46.7
21	12 46 19.26	-4.641	-9 12 26.1	+38.25	0 44.9	21	12 46 20.53	+13.610	-2 44 35.4	-87.09	22 48.3
22	12 44 15.90	5.633	8 54 57.7	49.15	0 38.9	22	12 51 51.42	13.953	3 20 12.7	90.89	22 50.0
23	12 41 49.29	6.574	8 33 6.5	60.10	0 32.5	23	12 57 29.82	14.238	3 57 12.6	93.90	22 51.8
24	12 39 1.02	7.433	8 6 54.8	70.81	0 25.8	24	13 3 14.45	14.474	4 35 19.3	96.47	22 53.7
25	12 35 53.44	8.176	7 36 32.2	80.95	0 18.8	25	13 9 4.23	14.668	5 14 18.5	98.38	22 55.7
26	12 32 29.79	-8.767	-7 2 16.9	+90.13	0 11.5	26	13 14 58.24	+14.898	-5 53 57.6	-99.80	22 57.7
27	12 28 54.11	9.172	6 24 36.7	97.96	0 4.0	27	13 20 55.72	14.959	6 34 5.2	100.77	22 59.7
28	12 25 11.27	9.360	5 44 8.9	104.03	23 48.7	28	13 26 56.05	15.066	7 14 31.3	101.34	23 1.8
29	12 21 26.76	9.307	5 1 40.1	107.98	23 41.1	29	13 32 58.73	15.154	7 55 6.9	101.58	23 3.9
30	12 17 46.54	9.001	4 18 5.0	109.53	23 33.7	30	13 39 3.34	15.228	8 35 44.5	101.51	23 6.1
31	12 14 16.74	-8.440	-3 34 23.2	+108.51	23 26.6	31	13 45 9.56	+15.989	-9 16 17.0	-101.16	23 8.3
32	12 11 3.43	-7.630	-2 51 37.3	+104.88	23 19.8	32	13 51 17.15	+16.342	-9 56 38.4	-100.58	23 10.5
Day of the Month.						Day of the Month.					
Semidiameter . .						Semidiameter . .					
Hor. Parallax . .						Hor. Parallax . .					
	3d.	5th.	13th.	15th.	23d.		3d.	5th.	13th.	15th.	23d.
	3.5	3.8	4.2	4.6	5.0		4.8	4.2	3.6	3.2	2.8
	9.3	10.1	11.1	12.2	13.5		12.8	11.2	9.6	8.4	7.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	13 51 17.15	+15.340	- 9 56 38.4	-100.58	23 10.5	1	17 3 49.33	+16.912	-24 30 56.9	-33.91	0 22.7
2	13 57 25.93	15.368	10 36 43.4	99.79	23 12.7	2	17 10 35.83	16.908	24 43 51.9	30.67	0 25.5
3	14 3 35.75	15.430	11 16 26.9	98.81	23 15.0	3	17 17 23.48	17.008	24 55 28.5	27.37	0 28.4
4	14 9 46.53	15.468	11 55 44.7	97.66	23 17.2	4	17 24 12.14	17.047	25 5 45.2	24.02	0 31.3
5	14 15 53.20	15.504	12 34 33.3	96.37	23 19.5	5	17 31 1.66	17.079	25 14 40.7	20.60	0 34.2
6	14 22 10.73	+15.540	-13 12 49.3	-94.94	23 21.8	6	17 37 51.86	+17.103	-25 22 13.5	-17.13	0 37.1
7	14 28 24.12	15.576	13 50 29.6	93.40	23 24.1	7	17 44 42.51	17.117	25 28 22.6	13.62	0 40.0
8	14 34 38.39	15.613	14 27 31.4	91.74	23 26.4	8	17 51 33.37	17.120	25 33 6.6	10.05	0 42.9
9	14 40 53.57	15.652	15 3 52.3	89.98	23 28.7	9	17 58 24.18	17.112	25 36 24.4	6.42	0 45.8
10	14 47 9.68	15.691	15 39 20.9	88.13	23 31.1	10	18 5 14.61	17.089	25 38 14.7	- 2.76	0 48.7
11	14 53 26.77	+15.733	-16 14 22.2	-86.20	23 33.4	11	18 12 4.31	+17.050	-25 38 36.6	+ 0.94	0 51.6
12	14 59 44.89	15.778	16 48 27.1	84.19	23 35.8	12	18 18 52.86	16.993	25 37 29.6	4.68	0 54.4
13	15 6 4.11	15.825	17 21 42.9	82.11	23 38.2	13	18 25 39.81	16.916	25 34 52.7	8.42	0 57.3
14	15 12 24.49	15.874	17 54 7.7	79.95	23 40.6	14	18 32 24.63	16.816	25 30 45.5	12.18	1 0.1
15	15 18 46.07	15.925	18 25 39.9	77.72	23 43.1	15	18 39 6.75	16.690	25 25 7.8	15.95	1 2.8
16	15 25 8.92	+15.979	-18 56 17.9	-75.43	23 45.6	16	18 45 45.51	+16.535	-25 17 59.7	+19.71	1 5.5
17	15 31 33.10	16.036	19 26 0.3	73.08	23 48.1	17	18 52 20.18	16.349	25 9 21.6	23.45	1 8.2
18	15 37 58.65	16.094	19 54 45.4	70.67	23 50.6	18	18 58 49.90	16.193	24 50 14.3	27.15	1 10.8
19	15 44 25.65	16.155	20 22 31.9	68.19	23 53.1	19	19 5 13.73	15.856	24 47 39.1	30.78	1 13.2
20	15 50 54.11	16.218	20 49 18.2	65.65	23 55.6	20	19 11 30.61	15.542	24 34 37.9	24.31	1 15.5
21	15 57 24.09	+16.281	-21 15 2.9	-63.06	23 58.2	21	19 17 39.33	+15.175	-24 20 13.2	+37.72	1 17.7
22	16 3 55.60	16.345	21 39 44.7	60.41		22	19 23 38.51	14.746	24 4 28.3	40.98	1 19.8
23	16 10 28.68	16.412	22 3 22.2	57.70	0 0.8	23	19 29 26.60	14.949	23 47 27.4	44.05	1 21.6
24	16 17 3.35	16.478	22 25 53.9	54.93	0 3.5	24	19 35 1.87	13.676	23 29 15.8	46.87	1 23.3
25	16 23 39.60	16.544	22 47 18.5	52.11	0 6.2	25	19 40 22.38	13.018	23 9 59.8	49.40	1 24.7
26	16 30 17.44	+16.610	-23 7 34.5	-49.22	0 8.9	26	19 45 25.95	+12.963	-22 49 47.2	+51.56	1 25.8
27	16 36 56.85	16.675	23 26 40.5	46.28	0 11.6	27	19 50 10.13	11.400	22 28 47.2	53.35	1 26.5
28	16 43 37.79	16.738	23 44 35.2	43.27	0 14.3	28	19 54 32.22	10.420	22 7 10.3	54.64	1 26.9
29	16 50 20.23	16.798	24 1 17.1	40.21	0 17.1	29	19 58 29.29	9.314	21 45 9.0	55.37	1 26.9
30	16 57 4.10	16.857	24 16 44.8	37.09	0 19.9	30	20 1 58.20	8.071	21 22 57.4	55.48	1 26.4
31	17 3 49.33	+16.912	-24 30 56.9	-33.91	0 22.7	31	20 4 55.55	+ 6.684	-21 0 51.1	+54.90	1 25.4
32	17 10 35.83	+16.908	-24 43 51.9	-30.67	0 25.5	32	20 7 17.87	+ 5.151	-20 39 7.7	+53.58	1 23.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . . .	2.5	2.4	2.3	2.3	2.3	2.3	Semidiameter . .	2.4	2.5	2.6	2.7	3.0	3.3	3.8
Hor. Parallax . . .	6.6	6.3	6.2	6.1	6.1	6.2	Hor. Parallax . .	6.3	6.5	6.8	7.2	7.8	8.7	10.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	17 58 8.10	+13.695	-23 24 21.8	- 6.78	23 15.3	1	20 44 58.49	+12.891	-19 10 8.0	+45.55	23 59.6
2	18 3 36.68	13.703	23 26 42.8	4.97	23 16.9	2	20 50 7.27	12.841	18 51 36.3	46.92	
3	18 9 5.82	13.708	23 28 20.4	3.16	23 18.4	3	20 55 14.84	12.790	18 32 36.1	48.27	0 0.8
4	18 14 34.86	13.711	23 29 14.5	- 1.35	23 20.0	4	21 0 21.19	12.739	18 13 2.0	49.58	0 2.0
5	18 20 3.93	13.712	23 29 24.9	+ 0.47	23 21.5	5	21 5 26.31	12.688	17 52 56.6	50.87	0 3.1
6	18 25 32.99	+13.710	-23 28 51.8	+ 2.98	23 23.0	6	21 10 30.20	+12.637	-17 32 20.7	+52.19	0 4.2
7	18 31 1.97	13.705	23 27 35.1	4.10	23 24.5	7	21 15 32.87	12.586	17 11 15.1	53.35	0 5.3
8	18 36 30.81	13.698	23 25 34.8	5.99	23 26.1	8	21 20 34.31	12.535	16 49 40.4	54.54	0 6.4
9	18 41 59.44	13.688	23 22 51.0	7.73	23 27.6	9	21 25 34.54	12.484	16 27 37.4	55.71	0 7.5
10	18 47 27.82	13.676	23 19 23.7	9.54	23 28.1	10	21 30 33.55	12.434	16 5 6.8	56.84	0 8.5
11	18 52 55.88	+13.662	-23 15 13.1	+11.34	23 30.6	11	21 35 31.37	+12.384	-15 42 9.4	+57.95	0 9.5
12	18 58 23.56	13.645	23 10 19.4	13.13	23 32.1	12	21 40 28.00	12.335	15 18 45.8	59.02	0 10.5
13	19 3 50.80	13.626	23 4 42.7	14.92	23 33.6	13	21 45 23.45	12.286	14 54 56.9	60.06	0 11.4
14	19 9 17.55	13.604	22 58 23.3	16.70	23 35.1	14	21 50 17.73	12.237	14 30 43.4	61.07	0 12.4
15	19 14 43.75	13.580	22 51 21.5	18.46	23 36.6	15	21 55 10.85	12.190	14 6 6.1	62.05	0 13.3
16	19 20 9.35	+13.554	-22 43 37.5	+20.21	23 38.1	16	22 0 2.84	+12.143	-13 41 5.7	+62.99	0 14.3
17	19 25 34.29	13.525	22 35 11.7	21.94	23 39.6	17	22 4 53.71	12.097	13 15 43.1	63.90	0 15.2
18	19 30 58.51	13.494	22 26 4.4	23.66	23 41.1	18	22 9 43.49	12.052	12 49 59.0	64.78	0 16.1
19	19 36 21.97	13.461	22 16 16.0	25.37	23 42.5	19	22 14 32.19	12.006	12 23 54.1	65.63	0 17.0
20	19 41 44.62	13.426	22 5 47.0	27.05	23 43.9	20	22 19 19.84	11.964	11 57 29.3	66.44	0 17.9
21	19 47 6.40	+13.389	-21 54 37.8	+28.79	23 45.3	21	22 24 6.45	+11.921	-11 30 45.3	+67.22	0 18.7
22	19 52 27.28	13.351	21 42 48.8	30.37	23 46.7	22	22 28 52.06	11.880	11 3 42.9	67.97	0 19.5
23	19 57 47.23	13.311	21 30 20.4	32.00	23 48.1	23	22 33 36.68	11.840	10 36 22.9	68.69	0 20.3
24	20 3 6.18	13.269	21 17 13.2	33.61	23 49.5	24	22 38 20.36	11.801	10 8 46.0	69.38	0 21.1
25	20 8 24.10	13.225	21 3 27.7	35.19	23 50.8	25	22 43 3.13	11.763	9 40 53.1	70.03	0 21.9
26	20 13 40.97	+13.181	-20 49 4.4	+36.75	23 52.1	26	22 47 45.00	+11.727	- 9 12 44.0	+70.65	0 22.7
27	20 18 56.76	13.135	20 34 4.1	38.98	23 53.4	27	22 52 26.02	11.692	8 44 22.2	71.94	0 23.4
28	20 24 11.42	13.088	20 18 27.4	39.78	23 54.7	28	22 57 6.21	11.658	8 15 45.7	71.80	0 24.1
29	20 29 24.95	13.040	20 2 14.8	41.96	23 55.9	29	23 1 45.61	11.626	7 46 56.2	72.33	0 24.8
30	20 34 37.31	12.991	19 45 26.9	42.79	23 57.2	30	23 6 24.27	11.596	7 17 54.5	72.68	0 25.5
31	20 39 48.50	+12.941	-19 28 4.4	+44.15	23 58.4	31	23 11 2.22	+11.567	- 6 48 41.3	+73.96	0 26.2
32	20 44 58.49	+12.891	-19 10 8.0	+45.55	23 59.6	32	23 15 39.50	+11.540	- 6 19 17.3	+73.71	0 26.9

Day of the Month.	1st.	5th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter . .	5".1	5".1	5".1	5".1	5".0	5".0	5".0	Semidiameter	5".0	5".0	5".0	5".0	5".0
Hor. Parallax . .	5.3	5.3	5.3	5.2	5.2	5.2	5.2	Hor. Parallax	5.2	5.2	5.2	5.2	5.2

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
h m s	h m s	s	° ' "	"	h m	h m s	h m s	s	° ' "	"	h m
1	23 1 45.61	+11.008	-7 46 56.9	+72.33	0 24.8	1	1 23 30.48	+11.005	+7 46 58.9	+73.40	0 44.2
2	23 6 24.37	11.508	7 17 54.5	72.39	0 25.5	2	1 27 56.39	11.508	8 16 15.1	72.94	0 44.9
3	23 11 2.22	11.507	6 48 41.3	72.98	0 26.2	3	1 32 32.86	11.530	8 45 19.9	72.45	0 45.5
4	23 15 39.50	11.540	6 19 17.3	73.71	0 26.9	4	1 37 9.93	11.558	9 14 12.6	71.83	0 46.2
5	23 20 16.18	11.515	5 49 43.3	74.11	0 27.5	5	1 41 47.64	11.585	9 42 52.5	71.36	0 46.9
6	23 24 52.21	+11.001	-5 20 0.1	+74.40	0 28.2	6	1 46 26.02	+11.614	+10 11 18.9	+70.81	0 47.6
7	23 29 27.72	11.000	4 50 8.3	74.80	0 28.8	7	1 51 5.12	11.644	10 39 31.0	70.30	0 48.3
8	23 34 2.73	11.440	4 20 8.7	75.13	0 29.5	8	1 55 44.96	11.676	11 7 28.2	69.56	0 49.0
9	23 38 37.27	11.431	3 50 2.1	75.41	0 30.1	9	2 0 25.58	11.709	11 35 9.6	68.80	0 49.7
10	23 43 11.39	11.414	3 19 49.1	75.66	0 30.8	10	2 5 7.02	11.744	12 2 34.6	68.19	0 50.5
11	23 47 45.14	+11.300	-2 49 30.5	+75.88	0 31.4	11	2 9 45.30	+11.780	+12 29 42.4	+67.45	0 51.2
12	23 52 18.55	11.308	2 19 7.0	76.07	0 32.0	12	2 14 32.46	11.817	12 56 32.2	66.80	0 52.0
13	23 56 51.67	11.375	1 48 39.4	76.23	0 32.6	13	2 19 16.53	11.855	13 23 3.4	66.00	0 52.8
14	0 1 24.53	11.305	1 18 8.3	76.36	0 33.2	14	2 24 1.52	11.895	13 49 15.1	65.07	0 53.6
15	0 5 57.19	11.357	0 47 34.5	76.46	0 33.8	15	2 28 47.47	11.935	14 15 6.6	64.21	0 54.4
16	0 10 29.68	+11.351	-0 16 58.7	+76.53	0 34.4	16	2 33 34.39	+11.976	+14 40 37.1	+63.33	0 55.3
17	0 15 2.05	11.347	+0 13 38.3	76.57	0 35.0	17	2 38 22.31	12.018	15 5 46.0	62.41	0 56.1
18	0 19 34.34	11.344	0 44 15.9	76.57	0 35.6	18	2 43 11.25	12.061	15 30 32.4	61.46	0 57.0
19	0 24 6.59	11.343	1 14 53.3	76.54	0 36.2	19	2 48 1.23	12.104	15 54 55.6	60.47	0 57.9
20	0 28 38.84	11.344	1 45 20.6	76.49	0 36.8	20	2 52 52.26	12.148	16 18 54.8	59.46	0 58.8
21	0 33 11.14	+11.347	+2 16 4.2	+76.40	0 37.4	21	2 57 44.35	+12.193	+16 42 29.3	+58.41	0 59.7
22	0 37 43.50	11.351	2 46 36.4	76.38	0 38.0	22	3 2 37.52	12.238	17 5 38.4	57.33	1 0.7
23	0 42 15.98	11.357	3 17 5.3	76.13	0 38.6	23	3 7 31.77	12.283	17 28 21.2	56.22	1 1.6
24	0 46 48.63	11.365	3 47 30.3	75.95	0 39.2	24	3 12 27.11	12.326	17 50 36.8	55.06	1 2.6
25	0 51 21.48	11.374	4 17 50.6	75.73	0 39.8	25	3 17 23.54	12.376	18 12 24.9	53.91	1 3.6
26	0 55 54.58	+11.385	+4 48 5.4	+75.49	0 40.4	26	3 22 21.06	+12.419	+18 33 44.5	+52.71	1 4.6
27	1 0 27.96	11.398	5 18 14.0	75.28	0 41.0	27	3 27 19.67	12.465	18 54 34.9	51.46	1 5.6
28	1 5 1.66	11.413	5 48 15.7	74.92	0 41.6	28	3 32 19.39	12.510	19 14 55.5	50.22	1 6.7
29	1 9 35.72	11.408	6 18 9.8	74.50	0 42.3	29	3 37 20.20	12.556	19 34 45.4	48.93	1 7.8
30	1 14 10.18	11.445	6 47 55.5	74.22	0 42.9	30	3 42 22.10	12.601	19 54 4.1	47.61	1 8.9
31	1 18 45.09	+11.404	+7 17 32.1	+73.83	0 43.6	31	3 47 25.07	+12.646	+20 12 50.8	+46.27	1 10.0
32	1 23 20.48	+11.405	+7 46 58.9	+73.40	0 44.2	32	3 52 29.12	+12.690	+20 31 4.9	+44.90	1 11.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	5.0	5.0	5.0	5.0	5.0	5.0	Semidiameter . .	5.1	5.1	5.1	5.2	5.2	5.3
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.2	Hor. Parallax . .	5.3	5.3	5.3	5.4	5.4	5.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.										
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.					
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.						
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m					
1	3 47 25.07	+12.646	+20 12 50.8	+46.37	1 10.0	1	6 30 19.61	+13.308	+24 41 46.2	-5.94	1 50.8					
2	3 52 29.12	12.690	20 31 4.9	44.90	1 11.1	2	6 35 38.63	13.299	24 39 19.0	7.03	1 52.2					
3	3 57 34.22	12.734	20 48 45.7	43.50	1 12.2	3	6 40 57.63	13.274	24 36 8.8	8.82	1 53.5					
4	4 2 40.37	12.777	21 5 52.7	42.07	1 13.4	4	6 46 15.95	13.253	24 32 15.8	10.60	1 54.9					
5	4 7 47.55	12.820	21 22 25.1	40.62	1 14.6	5	6 51 33.75	13.230	24 27 40.3	12.37	1 56.2					
6	4 12 55.74	+12.862	+21 38 22.1	+39.14	1 15.8	6	6 56 50.96	+13.205	+24 22 22.4	-14.12	1 57.6					
7	4 18 4.92	12.903	21 53 43.9	37.64	1 17.0	7	7 2 7.53	13.177	24 16 22.4	15.87	1 58.9					
8	4 23 15.06	12.942	22 8 29.0	36.12	1 18.2	8	7 7 23.40	13.146	24 9 40.5	17.61	2 0.2					
9	4 28 26.14	12.981	22 22 37.2	34.57	1 19.4	9	7 12 38.51	13.113	24 2 17.1	19.34	2 1.5					
10	4 33 38.13	13.018	22 36 8.0	33.00	1 20.7	10	7 17 52.82	13.078	23 54 12.4	21.05	2 2.8					
11	4 38 51.01	+13.054	+22 49 0.8	+31.41	1 22.0	11	7 23 6.28	+13.042	+23 45 26.9	-22.74	2 4.1					
12	4 44 4.73	13.088	23 1 15.2	29.80	1 23.3	12	7 28 18.84	13.004	23 36 1.0	24.42	2 5.4					
13	4 49 19.25	13.121	23 12 50.6	28.16	1 24.6	13	7 33 30.45	12.964	23 25 55.1	26.06	2 6.6					
14	4 54 34.53	13.152	23 23 46.6	26.50	1 25.9	14	7 38 41.05	12.921	23 15 9.6	27.72	2 7.8					
15	4 59 50.53	13.181	23 34 2.7	24.83	1 27.2	15	7 43 50.61	12.876	23 3 44.9	29.34	2 9.0					
16	5 5 7.21	+13.208	+23 43 38.5	+23.14	1 28.6	16	7 48 59.09	+12.830	+22 51 41.4	-30.94	2 10.2					
17	5 10 24.52	13.233	23 52 33.5	21.43	1 29.9	17	7 54 6.44	12.789	22 38 59.7	32.52	2 11.4					
18	5 15 42.41	13.255	24 0 47.4	19.71	1 31.3	18	7 59 12.62	12.739	22 25 40.3	34.08	2 12.6					
19	5 21 0.80	13.276	24 8 19.9	17.98	1 32.6	19	8 4 17.59	12.681	22 11 43.8	35.69	2 13.7					
20	5 26 19.66	13.294	24 15 10.6	16.24	1 34.0	20	8 9 21.33	12.622	21 57 10.7	37.13	2 14.8					
21	5 31 38.92	+13.310	+24 21 19.2	+14.48	1 35.4	21	8 14 23.79	+12.576	+21 42 1.6	-38.62	2 15.9					
22	5 36 58.52	13.323	24 26 45.5	12.71	1 36.8	22	8 19 24.95	12.521	21 26 17.2	40.06	2 17.0					
23	5 42 18.41	13.334	24 31 29.3	10.93	1 38.2	23	8 24 24.78	12.465	21 9 57.9	41.52	2 18.1					
24	5 47 38.52	13.342	24 35 30.3	9.15	1 39.6	24	8 29 23.25	12.408	20 53 4.4	42.93	2 19.2					
25	5 52 58.78	13.347	24 38 48.4	7.36	1 41.0	25	8 34 20.35	12.350	20 35 37.4	44.32	2 20.2					
26	5 58 19.13	+13.350	+24 41 23.4	+5.56	1 42.4	26	8 39 16.06	+12.292	+20 17 37.5	-45.67	2 21.2					
27	6 3 39.52	13.349	24 43 15.3	3.76	1 43.8	27	8 44 10.35	12.233	19 59 5.5	46.99	2 22.2					
28	6 8 59.87	13.346	24 44 24.0	1.96	1 45.2	28	8 49 3.22	12.173	19 40 2.1	48.22	2 23.1					
29	6 14 20.12	13.341	24 44 49.4	+0.16	1 46.6	29	8 53 54.64	12.113	19 20 27.8	49.36	2 24.0					
30	6 19 40.20	13.333	24 44 31.6	-1.64	1 48.0	30	8 58 44.62	12.052	19 0 23.4	50.80	2 24.9					
31	6 25 0.05	+13.322	+24 43 30.4	-3.44	1 49.4	31	9 3 33.16	+11.992	+18 39 49.5	-52.01	2 25.7					
32	6 30 19.61	+13.308	+24 41 46.2	-5.94	1 50.8	32	9 8 20.26	+11.932	+18 18 46.8	-53.20	2 26.5					
Day of the Month.		1st.	5th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .		5.3	5.4	5.4	5.5	5.6	5.7	5.8	Semidiameter . .		5.9	6.0	6.1	6.2	6.4	6.5
Hor. Parallax . .		5.5	5.6	5.6	5.7	5.8	5.9	6.0	Hor. Parallax . .		6.1	6.2	6.3	6.4	6.6	6.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	9 3 33.16	+11.999	+18 39 49.5	-62.01	2 25.7	1	11 21 43.49	+10.430	+ 5 2 44.4	-75.07	2 41.6
2	9 8 20.26	11.939	18 18 46.8	53.20	2 26.5	2	11 25 53.39	10.396	4 32 39.4	75.35	2 41.8
3	9 13 5.91	11.879	17 57 16.0	54.35	2 27.3	3	11 30 2.50	10.364	4 2 28.0	75.61	2 42.0
4	9 17 50.12	11.819	17 35 17.9	55.48	2 28.1	4	11 34 10.84	10.333	3 32 10.7	75.84	2 42.2
5	9 22 32.90	11.752	17 12 53.1	56.58	2 28.9	5	11 38 18.46	10.303	3 1 48.2	76.04	2 42.4
6	9 27 14.25	+11.693	+16 50 2.3	-57.65	2 29.7	6	11 42 25.38	+10.275	+ 2 31 21.2	-76.21	2 42.6
7	9 31 54.18	11.634	16 26 46.3	58.68	2 30.4	7	11 46 31.65	10.248	2 0 50.2	76.36	2 42.8
8	9 36 32.71	11.576	16 3 5.6	59.69	2 31.1	8	11 50 37.29	10.222	1 30 15.9	76.49	2 42.9
9	9 41 9.85	11.519	15 39 1.2	60.67	2 31.8	9	11 54 42.34	10.198	0 59 39.0	76.59	2 43.0
10	9 45 45.62	11.460	15 14 33.7	61.69	2 32.4	10	11 58 46.83	10.175	+ 0 28 59.9	76.67	2 43.1
11	9 50 20.02	+11.406	+14 49 43.8	-62.54	2 33.0	11	12 2 50.79	+10.154	- 0 1 40.8	-76.73	2 43.2
12	9 54 53.08	11.350	14 24 32.0	63.43	2 33.6	12	12 6 54.26	10.134	0 32 22.3	76.74	2 43.3
13	9 59 24.81	11.295	13 58 59.2	64.30	2 34.2	13	12 10 57.25	10.115	1 3 4.0	76.74	2 43.4
14	10 3 55.23	11.241	13 33 6.1	65.13	2 34.8	14	12 14 59.80	10.097	1 33 45.4	76.71	2 43.5
15	10 8 24.36	11.186	13 6 53.3	65.93	2 35.3	15	12 19 1.92	10.080	2 4 25.7	76.65	2 43.6
16	10 12 52.22	+11.135	+12 40 21.6	-66.70	2 35.8	16	12 23 3.65	+10.064	- 2 35 4.3	-76.57	2 43.7
17	10 17 18.83	11.083	12 13 31.8	67.45	2 36.3	17	12 27 5.01	10.046	3 5 40.7	76.46	2 43.8
18	10 21 44.21	11.032	11 46 24.5	68.16	2 36.8	18	12 31 6.04	10.035	3 36 14.1	76.32	2 43.9
19	10 26 8.38	10.982	11 19 0.5	68.84	2 37.3	19	12 35 6.73	10.022	4 6 44.0	76.16	2 44.0
20	10 30 31.36	10.933	10 51 20.4	69.49	2 37.8	20	12 39 7.12	10.010	4 37 9.6	75.97	2 44.0
21	10 34 53.18	+10.885	+10 23 25.0	-70.11	2 38.2	21	12 43 7.23	+ 9.999	- 5 7 30.3	-75.75	2 44.1
22	10 39 13.85	10.839	9 55 15.0	70.71	2 38.6	22	12 47 7.07	9.988	5 37 45.6	75.51	2 44.1
23	10 43 33.40	10.792	9 26 51.0	71.28	2 39.0	23	12 51 6.65	9.978	6 7 54.7	75.24	2 44.2
24	10 47 51.86	10.747	8 58 13.8	71.82	2 39.4	24	12 55 6.01	9.969	6 37 57.1	74.94	2 44.2
25	10 52 9.25	10.703	8 29 24.1	72.33	2 39.7	25	12 59 5.15	9.960	7 7 52.0	74.68	2 44.3
26	10 56 25.61	+10.660	+ 8 0 22.7	-72.80	2 40.0	26	13 3 4.10	+ 9.952	- 7 37 33.9	-74.37	2 44.3
27	11 0 40.95	10.616	7 31 10.1	73.24	2 40.3	27	13 7 2.86	9.945	8 7 17.2	73.90	2 44.3
28	11 4 55.31	10.578	7 1 47.1	73.68	2 40.6	28	13 11 1.46	9.939	8 36 46.2	73.50	2 44.4
29	11 9 8.71	10.539	6 32 14.4	74.05	2 40.8	29	13 14 59.91	9.933	9 6 5.2	73.08	2 44.1
30	11 13 21.18	10.501	6 2 32.6	74.42	2 41.1	30	13 18 58.22	9.927	9 35 13.8	72.63	2 44.4
31	11 17 32.76	+10.465	+ 5 32 42.4	-74.76	2 41.3	31	13 22 56.41	+ 9.922	-10 4 11.3	-72.16	2 44.4
32	11 21 43.49	+10.430	+ 5 2 44.4	-75.07	2 41.6	32	13 26 54.49	+ 9.916	-10 32 57.1	-71.68	2 44.4
Day of the Month.						Day of the Month.					
5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . 6.7 6.9 7.1 7.3 7.5 7.7						Semidiameter . . 8.0 8.3 8.6 8.9 9.3 9.7 9.8					
Hor. Parallax . . 6.9 7.1 7.3 7.5 7.8 8.0						Hor. Parallax . . 8.3 8.6 8.9 9.3 9.7 10.1					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.		
h m s	s	° ' "	"	h m	h m s	s	° ' "	"	h m				
1 13 26 54.49	+9.918	-10 32 57.1	-71.06	2 44.4	1 15 24 34.38	+9.480	-23 38 27.9	-45.84	2 43.9				
2 13 30 52.46	9.914	11 1 30.7	71.14	2 44.5	2 15 28 21.33	9.431	22 56 34.0	44.66	2 43.7				
3 13 34 50.36	9.911	11 29 51.5	70.59	2 44.5	3 15 32 7.04	9.378	23 14 11.5	43.46	2 43.5				
4 13 38 48.18	9.906	11 57 58.9	70.09	2 44.5	4 15 35 51.43	9.330	23 31 20.2	42.26	2 43.3				
5 13 42 45.94	9.905	12 25 52.3	69.43	2 44.5	5 15 39 34.39	9.286	23 47 59.6	41.02	2 43.1				
6 13 46 43.63	+9.902	-12 53 31.1	-68.81	2 44.5	6 15 43 15.82	+9.192	-24 4 9.5	-39.79	2 42.9				
7 13 50 41.26	9.899	13 20 54.9	68.17	2 44.5	7 15 46 55.61	9.121	24 19 49.6	38.55	2 42.6				
8 13 54 38.83	9.897	13 48 3.0	67.50	2 44.5	8 15 50 33.62	9.045	24 34 59.7	37.29	2 42.3				
9 13 58 36.33	9.894	14 14 54.9	66.81	2 44.6	9 15 54 9.73	8.963	24 49 39.4	36.02	2 41.9				
10 14 2 33.76	9.891	14 41 29.9	66.10	2 44.6	10 15 57 43.79	8.875	25 3 48.5	34.74	2 41.5				
11 14 6 31.11	+9.888	-15 7 47.6	-65.37	2 44.6	11 16 1 15.66	+8.780	-25 17 26.8	-33.45	2 41.1				
12 14 10 28.38	9.884	15 33 47.4	64.61	2 44.6	12 16 4 45.18	8.679	25 30 33.9	32.15	2 40.6				
13 14 14 25.54	9.880	15 59 28.7	63.83	2 44.6	13 16 8 12.19	8.571	25 43 9.8	30.84	2 40.1				
14 14 18 22.58	9.874	16 24 51.0	63.02	2 44.7	14 16 11 36.52	8.455	25 55 14.2	29.52	2 39.6				
15 14 22 19.47	9.867	16 49 53.6	62.19	2 44.7	15 16 14 57.97	8.329	26 6 46.9	28.19	2 39.0				
16 14 26 16.17	+9.859	-17 14 35.9	-61.33	2 44.7	16 16 18 16.36	+8.900	-26 17 47.7	-26.86	2 38.4				
17 14 30 12.67	9.849	17 38 57.3	60.45	2 44.7	17 16 21 31.49	8.080	26 28 16.3	25.52	2 37.7				
18 14 34 8.92	9.838	18 2 57.4	59.55	2 44.7	18 16 24 43.14	7.911	26 38 12.5	24.17	2 36.9				
19 14 38 4.88	9.825	18 26 35.6	58.63	2 44.7	19 16 27 51.11	7.753	26 47 36.3	22.81	2 36.1				
20 14 42 0.50	9.810	18 49 51.3	57.68	2 44.7	20 16 30 55.16	7.584	26 56 27.4	21.45	2 35.2				
21 14 45 55.75	+9.793	-19 12 44.0	-56.71	2 44.6	21 16 33 55.06	+7.406	-27 4 45.7	-20.08	2 34.2				
22 14 49 50.56	9.774	19 35 13.1	55.71	2 44.6	22 16 36 50.55	7.217	27 12 31.1	18.70	2 33.2				
23 14 53 44.89	9.753	19 57 18.0	54.69	2 44.6	23 16 39 41.40	7.018	27 19 43.3	17.32	2 32.1				
24 14 57 38.68	9.729	20 18 58.2	53.65	2 44.5	24 16 42 27.34	6.806	27 26 22.3	15.93	2 30.9				
25 15 1 31.86	9.702	20 40 13.2	52.59	2 44.5	25 16 45 8.11	6.588	27 32 27.8	14.53	2 29.6				
26 15 5 24.36	+9.673	-21 1 2.5	-51.51	2 44.4	26 16 47 43.46	+6.356	-27 37 59.7	-13.13	2 28.3				
27 15 9 16.13	9.641	21 21 25.6	50.41	2 44.4	27 16 50 13.10	6.113	27 42 57.9	11.72	2 26.9				
28 15 13 7.09	9.606	21 41 22.1	49.29	2 44.3	28 16 52 36.77	5.858	27 47 22.2	10.30	2 25.3				
29 15 16 57.17	9.568	22 0 51.6	48.16	2 44.2	29 16 54 54.17	5.591	27 51 12.4	8.87	2 23.6				
30 15 20 46.30	9.526	22 19 53.6	47.01	2 44.1	30 16 57 5.03	5.319	27 54 28.3	7.44	2 21.8				
31 15 24 34.38	+9.480	-22 38 27.9	-45.84	2 43.9	31 16 59 9.06	+5.022	-27 57 9.6	-6.00	2 20.0				
32 15 28 21.33	+9.431	-22 56 34.0	-44.66	2 43.7	32 17 1 5.99	+4.790	-27 59 16.1	-4.55	2 18.0				
Day of the Month.						Day of the Month.							
3d.	5th.	13th.	18th.	23d.	28th.	3d.	5th.	13th.	18th.	23d.	28th.		
Semidiameter . .	10.2	10.7	11.3	11.9	12.5	13.3	Semidiameter . .	14.2	15.1	16.2	17.4	18.8	20.3
Hor. Parallax . .	10.6	11.1	11.6	12.3	13.0	13.8	Hor. Parallax . .	14.6	15.6	16.8	18.0	19.4	21.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	17 1 5.99	+4.790	-27 59 16.1	- 4.55	2 18.0	1	16 48 23.65	-6.093	-23 43 38.0	+48.51	0 7.2			
2	17 2 55.52	4.405	28 0 47.6	3.08	2 15.9	2	16 45 56.57	6.157	23 24 0.9	49.54	23 44.4			
3	17 4 37.34	4.078	28 1 43.6	1.60	2 13.6	3	16 43 28.47	6.177	23 4 1.8	50.34	23 48.0			
4	17 6 11.16	3.739	28 2 3.8	- 0.10	2 11.2	4	16 41 0.44	6.151	22 43 46.3	50.90	23 41.7			
5	17 7 36.70	3.398	28 1 47.8	+ 1.43	2 8.7	5	16 38 33.58	6.080	22 23 20.4	51.21	23 35.4			
6	17 8 53.66	+3.034	-28 0 54.8	+ 2.98	2 6.0	6	16 36 8.92	-5.968	-22 2 50.1	+51.26	23 29.2			
7	17 10 1.76	2.649	27 59 24.3	4.56	2 3.2	7	16 33 47.44	5.815	21 42 21.7	51.06	23 23.0			
8	17 11 0.71	2.262	27 57 15.8	6.16	2 0.3	8	16 31 30.09	5.622	21 22 1.8	50.57	23 16.9			
9	17 11 50.25	1.864	27 54 28.5	7.79	1 57.2	9	16 29 17.77	5.396	21 1 56.5	49.63	23 10.8			
10	17 12 30.10	1.455	27 51 1.6	9.46	1 53.9	10	16 27 11.27	5.138	20 42 12.0	48.84	23 4.9			
11	17 13 0.03	+1.038	-27 46 54.0	+11.17	1 50.4	11	16 25 11.34	-4.850	-20 22 54.0	+47.62	22 59.1			
12	17 13 19.83	0.611	27 42 5.0	12.92	1 46.8	12	16 23 18.66	4.536	20 4 7.8	46.18	22 53.4			
13	17 13 29.30	+0.176	27 36 33.7	14.71	1 43.0	13	16 21 33.82	4.198	19 45 58.5	44.55	22 47.8			
14	17 13 28.25	-0.265	27 30 18.8	16.55	1 39.1	14	16 19 57.30	3.841	19 28 30.7	42.73	22 42.4			
15	17 13 16.56	0.710	27 23 19.1	18.43	1 35.0	15	16 18 29.55	3.409	19 11 48.5	40.76	22 37.1			
16	17 12 54.15	-1.158	-27 15 33.7	+20.36	1 30.7	16	16 17 10.90	-3.083	-18 55 55.5	+38.65	22 32.0			
17	17 12 20.97	1.006	27 7 1.7	22.33	1 26.2	17	16 16 1.66	2.686	18 40 54.5	36.42	22 27.1			
18	17 11 37.08	2.051	26 57 41.9	24.33	1 21.4	18	16 15 2.04	2.361	18 26 48.1	34.11	22 22.4			
19	17 10 42.57	2.401	26 47 33.6	26.36	1 16.5	19	16 14 12.20	1.872	18 13 38.1	31.72	22 17.8			
20	17 9 37.58	2.923	26 36 36.1	28.43	1 11.5	20	16 13 32.21	1.460	18 1 26.0	29.29	22 13.4			
21	17 8 22.35	-3.344	-26 24 48.8	+30.51	1 6.3	21	16 13 2.13	-1.047	-17 50 12.7	+26.82	22 9.1			
22	17 6 57.21	3.749	26 12 11.3	32.60	1 1.0	22	16 12 41.96	0.635	17 39 58.6	24.36	22 5.0			
23	17 5 22.60	4.133	25 58 43.6	34.68	0 55.5	23	16 12 31.64	-0.225	17 30 43.8	21.96	22 1.0			
24	17 3 39.02	4.494	25 44 26.3	36.73	0 49.9	24	16 12 31.11	+0.191	17 22 27.9	19.45	21 57.2			
25	17 1 47.08	4.899	25 29 20.4	38.74	0 44.1	25	16 12 40.26	0.581	17 15 10.2	17.04	21 53.5			
26	16 59 47.46	-5.134	-25 13 27.2	+40.66	0 38.2	26	16 12 58.94	+0.974	-17 8 49.6	+14.68	21 50.0			
27	16 57 40.91	5.405	24 56 48.6	42.58	0 32.2	27	16 13 26.96	1.360	17 3 24.9	12.38	21 46.7			
28	16 55 28.32	5.639	24 39 27.0	44.95	0 26.0	28	16 14 4.16	1.738	16 58 54.6	10.15	21 43.6			
29	16 53 10.58	5.833	24 21 25.6	45.84	0 19.8	29	16 14 50.33	2.107	16 55 17.0	8.00	21 40.6			
30	16 50 48.68	5.984	24 2 47.8	47.27	0 13.5	30	16 15 45.24	2.406	16 52 29.8	5.94	21 37.7			
31	16 48 23.65	-6.093	-23 43 38.0	+48.51	0 7.2	31	16 16 48.67	+2.816	-16 50 31.3	+ 3.96	21 35.0			
32	16 45 56.57	-6.157	-23 24 0.9	+49.54	0 0.0	32	16 18 0.38	+3.156	-16 49 19.1	+ 2.06	21 32.3			
Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . . .	22.1	24.0	26.0	28.1	30.0	31.5	Semidiameter . .	32.2	32.1	31.1	29.6	27.6	25.5	23.5
Hor. Parallax . . .	22.9	24.9	27.0	29.1	31.1	32.6	Hor. Parallax . .	33.4	33.2	32.2	30.6	28.5	26.4	24.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	13 54 42.52	+5.351	-10 13 33.9	-29.54	19 8.9	1	14 59 36.15	+5.058	-15 35 51.5	-22.11	18 11.6
2	13 56 50.88	5.346	10 25 20.5	29.34	19 7.1	2	15 1 37.35	5.043	15 44 38.9	21.85	18 9.6
3	13 58 59.11	5.340	10 37 2.1	29.13	19 5.3	3	15 3 38.17	5.028	15 53 20.0	21.58	18 7.7
4	14 1 7.32	5.335	10 48 38.7	28.92	19 3.5	4	15 5 38.59	5.009	16 1 54.7	21.38	18 5.8
5	14 3 15.20	5.330	11 0 10.2	28.71	19 1.7	5	15 7 38.61	4.990	16 10 23.1	21.05	18 3.9
6	14 5 23.05	+5.324	-11 11 36.6	-28.49	18 59.9	6	15 9 38.21	+4.974	-16 18 45.1	-20.79	18 1.9
7	14 7 30.77	5.318	11 22 57.8	28.27	18 58.1	7	15 11 37.38	4.955	16 27 0.8	20.52	17 59.9
8	14 9 38.35	5.312	11 34 13.7	28.05	18 56.2	8	15 13 36.08	4.936	16 35 10.1	20.26	17 58.0
9	14 11 45.78	5.306	11 45 24.4	27.83	18 54.4	9	15 15 34.31	4.916	16 43 13.0	19.99	17 56.0
10	14 13 53.05	5.300	11 56 29.7	27.61	18 52.6	10	15 17 32.05	4.895	16 51 9.5	19.73	17 54.0
11	14 16 0.17	+5.294	-12 7 29.6	-27.38	18 50.8	11	15 19 29.28	+4.874	-16 58 59.5	-19.48	17 52.0
12	14 18 7.13	5.287	12 18 24.0	27.15	18 49.0	12	15 21 25.99	4.859	17 6 43.1	19.19	17 50.0
13	14 20 13.91	5.280	12 29 12.9	26.92	18 47.1	13	15 23 22.14	4.838	17 14 20.2	18.92	17 48.0
14	14 22 20.51	5.273	12 39 56.2	26.68	18 45.3	14	15 25 17.72	4.818	17 21 50.9	18.65	17 46.0
15	14 24 26.91	5.264	12 50 33.2	26.44	18 43.4	15	15 27 12.69	4.777	17 29 15.2	18.38	17 43.9
16	14 26 33.11	+5.255	-13 1 5.6	-26.20	18 41.6	16	15 29 7.04	+4.751	-17 36 32.9	-18.11	17 41.9
17	14 28 39.09	5.245	13 11 31.6	25.96	18 39.8	17	15 31 0.75	4.724	17 43 44.1	17.84	17 39.9
18	14 30 44.84	5.235	13 21 51.8	25.72	18 37.9	18	15 32 53.80	4.696	17 50 48.9	17.57	17 37.8
19	14 32 50.36	5.225	13 32 6.0	25.47	18 36.1	19	15 34 46.17	4.667	17 57 47.2	17.30	17 35.7
20	14 34 55.63	5.214	13 42 14.2	25.22	18 34.2	20	15 36 37.82	4.637	18 4 39.0	17.03	17 33.6
21	14 37 0.65	+5.203	-13 52 16.3	-24.97	18 32.4	21	15 38 28.74	+4.606	-18 11 24.4	-16.77	17 31.5
22	14 39 5.40	5.192	14 2 12.4	24.72	18 30.5	22	15 40 18.91	4.574	18 18 3.4	16.50	17 29.4
23	14 41 9.87	5.180	14 12 2.4	24.46	18 28.6	23	15 42 8.30	4.542	18 24 36.0	16.23	17 27.3
24	14 43 14.05	5.168	14 21 46.1	24.20	18 26.8	24	15 43 56.90	4.509	18 31 2.4	15.97	17 25.1
25	14 45 17.94	5.156	14 31 23.7	23.94	18 24.9	25	15 45 44.68	4.474	18 37 22.5	15.71	17 23.0
26	14 47 21.53	+5.143	-14 40 55.1	-23.68	18 23.0	26	15 47 31.62	+4.438	-18 43 36.3	-15.45	17 20.8
27	14 49 24.80	5.130	14 50 20.2	23.42	18 21.1	27	15 49 17.71	4.401	18 49 44.0	15.19	17 18.6
28	14 51 27.75	5.116	14 59 39.1	23.16	18 19.2	28	15 51 2.90	4.364	18 55 45.5	14.94	17 16.4
29	14 53 30.37	5.102	15 8 51.7	22.89	18 17.3	29	15 52 47.19	4.326	19 1 41.1	14.69	17 14.2
30	14 55 32.65	5.088	15 17 58.0	22.63	18 15.4	30	15 54 30.56	4.287	19 7 30.6	14.45	17 12.0
31	14 57 34.58	+5.073	-15 26 57.9	-22.37	18 13.5	31	15 56 12.98	+4.247	-19 13 14.3	-14.20	17 9.6
32	14 59 36.15	+5.058	-15 35 51.5	-22.11	18 11.6	32	15 57 54.42	+4.205	-19 18 52.1	-13.96	17 7.5
Day of the Month.						Day of the Month.					
1st.	5th.	10th.	15th.	20th.	25th.	1st.	5th.	10th.	15th.	20th.	25th.
Semidiameter . .	3.0	3.1	3.2	3.3	3.4	Semidiameter	3.8	3.9	4.1	4.3	4.5
Hor. Parallax . .	5.2	5.4	5.6	5.7	5.9	Hor. Parallax	6.6	6.9	7.2	7.5	7.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	15 52 47.19	+4.306	-19 1 41.1	-14.89	17 14.2	1	16 36 11.74	+2.411	-21 21 21.1	-8.36	15 55.0
2	15 54 30.56	4.967	19 7 30.6	14.45	17 12.0	2	16 37 8.54	2.391	21 24 40.7	8.34	15 52.0
3	15 56 12.96	4.947	19 13 14.3	14.30	17 9.8	3	16 38 3.18	2.320	21 27 56.9	8.11	15 49.0
4	15 57 54.49	4.905	19 18 52.1	13.96	17 7.5	4	16 38 55.59	2.137	21 31 9.9	7.96	15 45.9
5	15 59 34.85	4.109	19 24 24.1	13.79	17 5.2	5	16 39 45.73	2.041	21 34 19.9	7.85	15 42.8
6	16 1 14.24	+4.118	-19 29 50.4	-13.48	17 2.9	6	16 40 33.55	+1.943	-21 37 26.9	-7.79	15 39.7
7	16 2 52.57	4.074	19 35 11.0	13.25	17 0.6	7	16 41 18.99	1.843	21 40 30.8	7.60	15 36.4
8	16 4 29.81	4.096	19 40 26.0	13.03	16 58.3	8	16 42 1.99	1.740	21 43 31.8	7.46	15 33.1
9	16 6 5.91	3.980	19 45 35.5	12.79	16 55.9	9	16 42 42.48	1.634	21 46 30.0	7.36	15 29.8
10	16 7 40.84	3.930	19 50 39.4	12.56	16 53.6	10	16 43 20.42	1.596	21 49 25.4	7.25	15 26.5
11	16 9 14.57	+3.879	-19 55 37.9	-12.33	16 51.2	11	16 43 55.75	+1.416	-21 52 18.1	-7.14	15 23.1
12	16 10 47.05	3.896	20 0 31.1	12.11	16 48.8	12	16 44 28.41	1.304	21 55 8.1	7.03	15 19.7
13	16 12 18.25	3.779	20 5 18.9	11.89	16 46.3	13	16 44 58.33	1.188	21 57 55.4	6.89	15 16.2
14	16 13 48.12	3.716	20 10 1.5	11.67	16 43.9	14	16 45 25.46	1.071	22 0 40.0	6.81	15 12.7
15	16 15 16.62	3.656	20 14 38.8	11.45	16 41.4	15	16 45 49.76	0.959	22 3 22.1	6.70	15 9.2
16	16 16 43.71	+3.599	-20 19 11.0	-11.24	16 38.9	16	16 46 11.18	+0.839	-22 6 1.7	-6.59	15 5.6
17	16 18 9.35	3.538	20 23 38.1	11.03	16 36.4	17	16 46 29.65	0.706	22 8 38.7	6.46	15 1.9
18	16 19 33.50	3.475	20 28 0.3	10.80	16 33.8	18	16 46 45.13	0.581	22 11 13.1	6.36	14 58.2
19	16 20 56.11	3.409	20 32 17.5	10.58	16 31.2	19	16 46 57.56	0.453	22 13 45.0	6.27	14 54.5
20	16 22 17.15	3.342	20 36 29.8	10.43	16 28.6	20	16 47 6.92	0.325	22 16 14.3	6.17	14 50.7
21	16 23 36.56	+3.274	-20 40 37.5	-10.22	16 26.0	21	16 47 13.19	+0.196	-22 18 41.2	-6.06	14 46.8
22	16 24 54.31	3.204	20 44 40.6	10.03	16 23.3	22	16 47 16.33	+0.066	22 21 5.6	5.96	14 42.9
23	16 26 10.36	3.139	20 48 39.2	9.84	16 20.6	23	16 47 16.31	-0.067	22 23 27.3	5.85	14 38.9
24	16 27 24.69	3.059	20 52 33.3	9.66	16 17.9	24	16 47 13.09	0.201	22 25 46.6	5.75	14 34.9
25	16 28 37.23	2.994	20 56 23.1	9.48	16 15.2	25	16 47 6.65	0.336	22 28 3.3	5.64	14 30.8
26	16 29 47.94	+2.906	-21 0 8.7	-9.31	16 12.4	26	16 46 56.98	-0.470	-22 30 17.4	-5.53	14 26.7
27	16 30 56.79	2.830	21 3 50.2	9.15	16 9.6	27	16 46 44.08	0.605	22 32 28.8	5.42	14 22.5
28	16 32 3.74	2.749	21 7 27.8	8.99	16 6.8	28	16 46 27.92	0.749	22 34 37.4	5.30	14 18.3
29	16 33 8.76	2.667	21 11 1.6	8.83	16 3.9	29	16 46 8.48	0.878	22 36 43.4	5.18	14 14.0
30	16 34 11.80	2.584	21 14 31.7	8.68	16 1.0	30	16 45 45.76	1.015	22 38 46.3	5.06	14 9.7
31	16 35 12.81	+2.499	-21 17 58.1	-8.53	15 58.0	31	16 45 19.76	-1.151	-22 40 46.1	-4.93	14 5.3
32	16 36 11.74	+2.411	-21 21 21.1	-8.36	15 55.0	32	16 44 50.48	-1.298	-22 42 42.6	-4.79	14 0.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	4.7	4.9	5.1	5.4	5.7	6.0	Semidiameter . .	6.3	6.5	7.0	7.4	7.8	8.2
Hor. Parallax . .	8.2	8.6	9.0	9.4	9.9	10.4	Hor. Parallax . .	11.0	11.6	12.2	12.9	13.6	14.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.		
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	16 45 19.76	-1.151	-22 40 46.1	-4.93	14 5.3	1	16 9 42.12	-3.747	-23 2 27.4	+1.88	11 27.4
2	16 44 50.48	1.988	22 42 42.6	4.79	14 0.8	2	16 8 12.41	3.794	23 1 40.4	2.04	11 22.0
3	16 44 17.93	1.494	22 44 35.9	4.65	13 56.3	3	16 6 43.36	3.699	23 0 49.4	2.98	11 16.6
4	16 43 42.11	1.560	22 46 25.6	4.50	13 51.8	4	16 5 15.18	3.653	22 59 54.7	2.35	11 11.2
5	16 43 3.03	1.686	22 48 11.7	4.34	13 47.2	5	16 3 48.63	3.606	22 58 56.8	2.48	11 5.8
6	16 42 20.72	-1.830	-22 49 53.8	-4.17	13 42.5	6	16 2 22.99	-3.552	-22 57 55.9	+2.59	11 0.5
7	16 41 35.90	1.988	22 51 31.9	3.99	13 37.8	7	16 0 57.52	3.491	22 56 52.5	2.68	10 55.2
8	16 40 46.51	2.094	22 53 5.6	3.81	13 33.0	8	15 59 34.51	3.423	22 55 47.2	2.75	10 49.9
9	16 39 54.68	2.294	22 54 34.8	3.68	13 28.2	9	15 58 13.24	3.347	22 54 40.4	2.79	10 44.6
10	16 38 59.76	2.351	22 55 59.3	3.48	13 23.3	10	15 56 53.87	3.264	22 53 32.4	2.81	10 39.4
11	16 38 1.81	-2.476	-22 57 18.7	-3.21	13 18.4	11	15 55 36.58	-3.174	-22 52 24.0	+2.81	10 34.2
12	16 37 0.92	2.598	22 58 33.0	2.99	13 13.5	12	15 54 21.54	3.077	22 51 15.7	2.80	10 29.1
13	16 35 57.12	2.716	22 59 41.8	2.76	13 8.5	13	15 53 8.88	2.975	22 50 8.0	2.77	10 24.0
14	16 34 50.55	2.830	23 0 45.0	2.58	13 3.4	14	15 51 58.75	2.867	22 49 1.5	2.73	10 18.9
15	16 33 41.30	2.939	23 1 42.4	2.27	12 58.3	15	15 50 51.28	2.752	22 47 56.7	2.66	10 13.9
16	16 32 29.50	-3.043	-23 2 34.0	-2.02	12 53.1	16	15 49 46.64	-2.632	-22 46 54.4	+2.56	10 8.9
17	16 31 15.25	3.149	23 3 19.4	1.77	12 47.9	17	15 48 44.93	2.508	22 45 55.0	2.43	10 4.0
18	16 29 58.70	3.234	23 3 58.7	1.51	12 42.7	18	15 47 46.24	2.380	22 44 58.8	2.27	9 59.1
19	16 28 40.02	3.320	23 4 31.7	1.25	12 37.5	19	15 46 50.70	2.245	22 44 6.7	2.08	9 54.2
20	16 27 19.35	3.400	23 4 58.4	0.98	12 32.2	20	15 45 58.42	2.110	22 43 19.2	1.87	9 49.4
21	16 25 56.84	-3.479	-23 5 18.9	-0.72	12 26.9	21	15 45 9.44	-1.970	-22 42 36.6	+1.85	9 44.7
22	16 24 32.69	3.537	23 5 33.0	0.45	12 21.6	22	15 44 23.86	1.826	22 41 59.3	1.69	9 40.0
23	16 23 7.07	3.594	23 5 40.7	-0.19	12 16.2	23	15 43 41.71	1.683	22 41 27.8	1.18	9 35.4
24	16 21 40.17	3.643	23 5 42.2	+0.07	12 10.8	24	15 43 3.07	1.537	22 41 2.4	0.98	9 30.9
25	16 20 12.18	3.684	23 5 37.5	0.32	12 5.4	25	15 42 27.96	1.388	22 40 43.5	0.64	9 26.4
26	16 18 43.29	-3.718	-23 5 26.9	+0.57	12 0.0	26	15 41 56.42	-1.239	-22 40 31.4	+0.35	9 22.0
27	16 17 13.70	3.743	23 5 10.4	0.81	11 54.6	27	15 41 28.47	1.099	22 40 26.4	+0.66	9 17.6
28	16 15 43.61	3.760	23 4 48.3	1.04	11 49.2	28	15 41 4.10	0.946	22 40 28.6	-0.25	9 13.3
29	16 14 13.22	3.769	23 4 20.7	1.26	11 43.7	29	15 40 43.33	0.790	22 40 38.3	0.56	9 9.0
30	16 12 42.71	3.770	23 3 47.8	1.47	11 38.3	30	15 40 26.17	0.640	22 40 55.5	0.26	9 4.8
31	16 11 12.28	-3.769	-23 3 10.0	+1.67	11 32.9	31	15 40 12.61	-0.491	-22 41 20.4	-1.20	9 0.7
32	16 9 42.12	-3.747	-23 2 27.4	+1.88	11 27.4	32	15 40 2.62	-0.340	-22 41 53.0	-1.20	8 56.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	8.6	9.0	9.4	9.7	10.0	10.2	10.4	Semidiameter . .	10.4	10.4	10.2	10.0	9.8	9.5
Hor. Parallax . .	15.1	15.8	16.5	17.1	17.6	17.9	18.2	Hor. Parallax . .	18.2	18.2	17.9	17.6	17.1	16.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.									
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.				
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.					
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>				
1	15 40 12.61	-0.491	-22 41 20.4	-1.30	9 0.7	1	16 0 43.36	+3.546	-23 53 56.5	-9.33	7 19.8				
2	15 40 2.62	0.342	22 41 53.0	1.52	8 56.6	2	16 2 9.69	3.647	23 57 41.8	9.43	7 17.3				
3	15 39 56.20	0.193	22 42 33.5	1.85	8 52.6	3	16 3 38.42	3.747	24 1 29.3	9.52	7 14.8				
4	15 39 53.35	-0.045	22 43 21.9	2.18	8 48.6	4	16 5 9.52	3.845	24 5 18.7	9.59	7 12.4				
5	15 39 54.03	+0.101	22 44 18.1	2.51	8 44.7	5	16 6 42.96	3.941	24 9 9.6	9.65	7 10.0				
6	15 39 58.22	+0.248	-22 45 22.2	-2.84	8 40.9	6	16 8 18.70	+4.036	-24 13 1.8	-9.70	7 7.7				
7	15 40 5.91	0.394	22 46 34.3	3.17	8 37.1	7	16 9 56.70	4.130	24 16 54.8	9.73	7 5.4				
8	15 40 17.08	0.538	22 47 54.1	3.49	8 33.4	8	16 11 36.92	4.222	24 20 48.5	9.75	7 3.2				
9	15 40 31.70	0.681	22 49 21.8	3.82	8 29.7	9	16 13 19.34	4.313	24 24 42.6	9.75	7 1.0				
10	15 40 49.74	0.822	22 50 57.3	4.14	8 26.1	10	16 15 3.91	4.403	24 28 36.8	9.74	6 58.8				
11	15 41 11.18	+0.963	-22 52 40.6	-4.46	8 22.6	11	16 16 50.64	+4.491	-24 32 30.7	-9.72	6 56.6				
12	15 41 35.98	1.103	22 54 31.5	4.78	8 19.1	12	16 18 39.47	4.578	24 36 24.2	9.69	6 54.5				
13	15 42 4.14	1.242	22 56 30.0	5.10	8 15.6	13	16 20 30.37	4.664	24 40 16.7	9.68	6 52.4				
14	15 42 35.65	1.380	22 58 36.1	5.41	8 12.2	14	16 22 23.31	4.748	24 44 8.0	9.62	6 50.4				
15	15 43 10.45	1.518	23 0 49.5	5.71	8 8.9	15	16 24 18.28	4.831	24 47 58.0	9.56	6 48.4				
16	15 43 48.51	+1.653	-23 3 10.2	-6.00	8 5.6	16	16 26 15.23	+4.913	-24 51 46.3	-9.48	6 46.4				
17	15 44 29.77	1.786	23 5 37.9	6.29	8 2.4	17	16 28 14.11	4.993	24 55 32.5	9.38	6 44.4				
18	15 45 14.19	1.916	23 8 12.4	6.57	7 59.2	18	16 30 14.89	5.072	24 59 16.4	9.37	6 42.5				
19	15 46 1.73	2.045	23 10 53.6	6.85	7 56.1	19	16 32 17.56	5.149	25 2 57.5	9.15	6 40.6				
20	15 46 52.37	2.173	23 13 41.2	7.12	7 53.0	20	16 34 22.07	5.224	25 6 35.7	9.02	6 38.8				
21	15 47 46.06	+2.300	-23 16 35.1	-7.37	7 50.0	21	16 36 28.40	+5.306	-25 10 10.6	-8.87	6 37.0				
22	15 48 42.75	2.424	23 19 35.0	7.61	7 47.0	22	16 38 36.49	5.371	25 13 41.9	8.71	6 35.2				
23	15 49 42.39	2.546	23 22 40.5	7.84	7 44.1	23	16 40 46.28	5.443	25 17 9.1	8.54	6 33.4				
24	15 50 44.92	2.665	23 25 51.5	8.06	7 41.2	24	16 42 57.76	5.514	25 20 32.1	8.36	6 31.6				
25	15 51 50.30	2.782	23 29 7.6	8.26	7 38.4	25	16 45 10.90	5.582	25 23 50.5	8.17	6 29.9				
26	15 52 58.48	+2.897	-23 32 28.5	-8.45	7 35.6	26	16 47 25.66	+5.646	-25 27 4.0	-7.96	6 28.2				
27	15 54 9.40	3.011	23 35 53.8	8.63	7 32.8	27	16 49 42.01	5.712	25 30 12.3	7.74	6 26.6				
28	15 55 23.01	3.122	23 39 23.3	8.80	7 30.1	28	16 51 59.90	5.776	25 33 15.1	7.50	6 24.9				
29	15 56 39.27	3.231	23 42 56.7	8.96	7 27.5	29	16 54 19.30	5.839	25 36 12.1	7.25	6 23.3				
30	15 57 58.11	3.338	23 46 33.6	9.10	7 24.9	30	16 56 40.18	5.901	25 39 3.0	6.99	6 21.7				
31	15 59 19.49	+3.443	-23 50 13.7	-9.28	7 22.3	31	16 59 2.52	+5.961	-25 41 47.4	-6.72	6 20.2				
32	16 0 43.36	+3.546	-23 53 56.5	-9.33	7 19.8	32	17 1 26.28	+6.019	-25 44 25.1	-6.44	6 18.6				
Day of the Month.		5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.		4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .		9.2	8.9	8.6	8.2	7.9	7.6	Semidiameter . .		7.3	7.1	6.8	6.6	6.3	6.1
Hor. Parallax . .		16.1	15.5	15.0	14.4	13.9	13.4	Hor. Parallax . .		12.9	12.4	11.9	11.5	11.1	10.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	17 1 26.28	+6.019	-25 44 25.1	-6.44	6 18.6	1	18 22 14.11	+7.972	-25 52 45.6	+6.36	5 41.3		
2	17 3 51.42	6.076	25 46 56.0	6.14	6 17.1	2	18 25 8.98	7.996	25 50 9.0	6.79	5 40.3		
3	17 6 17.93	6.132	25 49 19.7	5.83	6 15.6	3	18 28 4.41	7.990	25 47 19.5	7.39	5 39.3		
4	17 8 45.78	6.188	25 51 35.9	5.51	6 14.1	4	18 31 0.39	7.943	25 44 17.2	7.86	5 38.3		
5	17 11 14.96	6.243	25 53 44.6	5.18	6 12.7	5	18 33 56.90	7.965	25 41 2.0	8.40	5 37.3		
6	17 13 45.44	+6.297	-25 55 45.4	-4.85	6 11.3	6	18 36 53.91	+7.985	-25 37 33.7	+8.85	5 36.3		
7	17 16 17.20	6.349	25 57 38.1	4.51	6 9.9	7	18 39 51.40	7.405	25 33 52.3	9.50	5 35.3		
8	17 18 50.20	6.400	25 59 22.2	4.16	6 8.5	8	18 42 49.35	7.494	25 29 57.8	10.05	5 34.3		
9	17 21 24.42	6.451	26 0 57.7	3.80	6 7.1	9	18 45 47.75	7.442	25 25 50.0	10.60	5 33.3		
10	17 23 59.85	6.501	26 2 24.5	3.43	6 5.8	10	18 48 46.58	7.459	25 21 28.9	11.15	5 32.4		
11	17 26 36.46	+6.549	-26 3 42.2	-3.05	6 4.4	11	18 51 45.81	+7.475	-25 16 54.5	+11.71	5 31.4		
12	17 29 14.24	6.597	26 4 50.7	2.66	6 3.1	12	18 54 45.42	7.491	25 12 6.6	12.27	5 30.5		
13	17 31 53.16	6.644	26 5 49.7	2.26	6 1.8	13	18 57 45.39	7.506	25 7 5.3	12.83	5 29.6		
14	17 34 33.18	6.690	26 6 39.0	1.85	6 0.6	14	19 0 45.69	7.520	25 1 50.5	13.39	5 28.6		
15	17 37 14.28	6.735	26 7 18.4	1.43	5 59.3	15	19 3 46.30	7.532	24 56 22.1	13.96	5 27.7		
16	17 39 56.43	+6.778	-26 7 47.7	-1.01	5 58.1	16	19 6 47.19	+7.543	-24 50 40.3	+14.52	5 26.8		
17	17 42 39.61	6.819	26 8 6.7	0.58	5 56.9	17	19 9 48.35	7.553	24 44 44.8	15.09	5 25.8		
18	17 45 23.77	6.860	26 8 15.2	-0.14	5 55.7	18	19 12 49.73	7.569	24 38 35.8	15.65	5 24.9		
19	17 48 8.90	6.900	26 8 12.9	+0.31	5 54.5	19	19 15 51.32	7.570	24 32 13.2	16.22	5 24.0		
20	17 50 54.96	6.938	26 7 59.7	0.77	5 53.3	20	19 18 53.10	7.578	24 25 37.1	16.78	5 23.1		
21	17 53 41.92	+6.975	-26 7 35.4	+1.24	5 52.2	21	19 21 55.04	+7.584	-24 18 47.5	+17.35	5 22.2		
22	17 56 29.74	7.010	26 6 59.8	1.72	5 51.0	22	19 24 57.11	7.589	24 11 44.3	17.91	5 21.3		
23	17 59 18.40	7.044	26 6 12.7	2.21	5 49.9	23	19 27 59.29	7.593	24 4 27.6	18.47	5 20.4		
24	18 2 7.86	7.077	26 5 14.0	2.70	5 48.8	24	19 31 1.55	7.596	23 56 57.4	19.03	5 19.5		
25	18 4 58.09	7.109	26 4 3.6	3.19	5 47.7	25	19 34 3.88	7.598	23 49 13.7	19.59	5 18.6		
26	18 7 49.07	+7.139	-26 2 41.3	+3.69	5 46.6	26	19 37 6.25	+7.599	-23 41 16.7	+20.15	5 17.6		
27	18 10 40.76	7.168	26 1 6.8	4.19	5 45.5	27	19 40 8.64	7.600	23 33 6.4	20.71	5 16.7		
28	18 13 33.13	7.196	25 59 20.1	4.70	5 44.4	28	19 43 11.05	7.600	23 24 42.8	21.26	5 15.8		
29	18 16 26.16	7.223	25 57 21.1	5.22	5 43.4	29	19 46 13.45	7.599	23 16 5.9	21.81	5 14.9		
30	18 19 19.83	7.247	25 55 9.6	5.74	5 42.3	30	19 49 15.82	7.598	23 7 15.9	22.36	5 14.0		
31	18 22 14.11	+7.272	-25 52 45.6	+6.26	5 41.3	31	19 52 18.15	+7.596	-22 58 12.9	+22.90	5 13.1		
32	18 25 8.98	+7.296	-25 50 9.0	+6.79	5 40.3	32	19 55 20.42	+7.594	-22 48 56.8	+23.44	5 12.2		
Day of the Month.	3d.	5th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	5th.	13th.	18th.	23d.	28th.
Semidiameter . .	5.9	5.7	5.5	5.4	5.2	5.1	Semidiameter . .	4.9	4.8	4.6	4.5	4.4	4.3
Hor. Parallax . .	10.4	10.0	9.7	9.4	9.2	8.9	Hor. Parallax . .	8.6	8.4	8.1	7.9	7.7	7.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.		
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	19 55 20.42	+7.504	-22 48 56.8	+23.44	5 12.2	1	21 25 7.89	+7.319	-16 38 46.9	+37.38	4 43.7
2	19 58 22.63	7.501	22 39 27.8	23.98	5 11.3	2	21 28 3.19	7.998	16 23 45.4	37.74	4 42.7
3	20 1 24.77	7.587	22 29 45.9	24.51	5 10.4	3	21 30 58.17	7.984	16 6 35.2	38.10	4 41.7
4	20 4 26.81	7.583	22 19 51.3	25.04	5 9.5	4	21 33 52.82	7.971	15 53 16.5	38.45	4 40.6
5	20 7 28.74	7.579	22 9 44.0	25.57	5 8.6	5	21 36 47.15	7.958	15 37 49.4	38.80	4 39.6
6	20 10 30.57	+7.574	-21 59 24.1	+26.09	5 7.7	6	21 39 41.16	+7.944	-15 22 14.2	+39.14	4 38.5
7	20 13 32.28	7.569	21 48 51.7	26.61	5 6.8	7	21 42 34.84	7.930	15 6 30.9	39.47	4 37.5
8	20 16 33.86	7.563	21 38 6.7	27.19	5 5.9	8	21 45 28.20	7.916	14 50 39.7	39.79	4 36.5
9	20 19 35.30	7.556	21 27 9.6	27.63	5 5.0	9	21 48 21.24	7.903	14 34 40.8	40.11	4 35.4
10	20 22 36.58	7.550	21 16 0.2	28.14	5 4.1	10	21 51 13.96	7.190	14 18 34.5	40.43	4 34.4
11	20 25 37.69	+7.543	-21 4 38.8	+28.64	5 3.2	11	21 54 6.38	+7.177	-14 2 20.7	+40.72	4 33.3
12	20 28 38.62	7.535	20 53 5.4	29.13	5 2.2	12	21 56 58.47	7.164	13 45 59.8	41.01	4 32.2
13	20 31 39.36	7.527	20 41 20.1	29.62	5 1.3	13	21 59 50.24	7.150	13 29 31.9	41.29	4 31.2
14	20 34 39.90	7.518	20 29 23.1	30.11	5 0.3	14	22 2 41.69	7.137	13 12 57.3	41.57	4 30.1
15	20 37 40.23	7.509	20 17 14.5	30.59	4 59.4	15	22 5 32.82	7.124	12 56 16.0	41.85	4 29.0
16	20 40 40.34	+7.499	-20 4 54.4	+31.07	4 58.4	16	22 8 23.62	+7.110	-12 39 28.3	+42.12	4 27.9
17	20 43 40.20	7.490	19 52 23.1	31.54	4 57.5	17	22 11 14.10	7.096	12 22 34.4	42.38	4 26.8
18	20 46 39.81	7.478	19 39 40.6	32.00	4 56.5	18	22 14 4.26	7.083	12 5 34.5	42.63	4 25.7
19	20 49 39.16	7.467	19 26 47.1	32.45	4 55.6	19	22 16 54.10	7.069	11 48 28.9	42.87	4 24.6
20	20 52 38.23	7.456	19 13 42.7	32.90	4 54.6	20	22 19 43.61	7.056	11 31 17.6	43.09	4 23.5
21	20 55 37.03	+7.444	-19 0 27.7	+33.34	4 53.7	21	22 22 32.81	+7.043	-11 14 0.9	+43.30	4 22.3
22	20 58 35.53	7.431	18 47 2.2	33.78	4 52.7	22	22 25 21.69	7.030	10 56 39.0	43.50	4 21.2
23	21 1 33.73	7.418	18 33 26.3	34.21	4 51.7	23	22 28 10.26	7.017	10 39 12.0	43.70	4 20.1
24	21 4 31.62	7.405	18 19 40.2	34.63	4 50.7	24	22 30 58.51	7.004	10 21 40.2	43.90	4 19.0
25	21 7 29.20	7.392	18 5 44.2	35.04	4 49.8	25	22 33 46.45	6.991	10 4 3.8	44.10	4 17.8
26	21 10 26.46	+7.379	-17 51 38.3	+35.45	4 48.8	26	22 36 34.09	+6.979	-9 46 23.0	+44.29	4 16.7
27	21 13 23.40	7.366	17 37 22.7	35.85	4 47.8	27	22 39 21.44	6.967	9 28 37.9	44.47	4 15.5
28	21 16 20.01	7.353	17 22 57.6	36.24	4 46.8	28	22 42 8.49	6.955	9 10 48.6	44.64	4 14.4
29	21 19 16.29	7.339	17 8 23.2	36.63	4 45.8	29	22 44 55.26	6.943	8 52 55.5	44.80	4 13.2
30	21 22 12.96	7.325	16 53 39.6	37.01	4 44.7	30	22 47 41.75	6.932	8 34 58.5	44.95	4 12.0
31	21 25 7.89	+7.312	-16 38 46.9	+37.38	4 43.7	31	22 50 27.98	+6.921	-8 16 58.0	+45.09	4 10.8
32	21 28 3.19	+7.298	-16 23 45.4	+37.74	4 42.7	32	22 53 13.94	+6.910	-7 58 54.1	+45.23	4 9.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	31d.
Semidiameter . . .	4.2	4.1	4.0	3.9	3.8	3.7	Semidiameter . .	3.6	3.5	3.5	3.4	3.3	3.2	3.1
Hor. Parallax . . .	7.3	7.1	6.9	6.8	6.6	6.5	Hor. Parallax . .	6.3	6.2	6.0	5.9	5.7	5.6	5.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	19 17 53.28	+2.501	-22 26 20.2	+4.41	0 33.4	1	19 48 39.70	+2.422	-21 21 8.7	+5.98	22 59.3
2	19 18 53.33	2.502	22 24 33.6	4.47	0 30.5	2	19 49 37.75	2.416	21 18 44.8	6.02	22 56.3
3	19 19 53.39	2.503	22 22 45.6	4.53	0 27.5	3	19 50 35.64	2.409	21 16 20.0	6.06	22 53.3
4	19 20 53.47	2.503	22 20 56.2	4.59	0 24.6	4	19 51 33.37	2.402	21 13 54.3	6.09	22 50.3
5	19 21 53.56	2.504	22 19 5.3	4.65	0 21.7	5	19 52 30.93	2.395	21 11 27.8	6.12	22 47.4
6	19 22 53.66	+2.504	-22 17 13.0	+4.71	0 18.8	6	19 53 28.32	+2.388	-21 9 0.6	+6.15	22 44.4
7	19 23 53.76	2.504	22 15 19.3	4.77	0 15.8	7	19 54 25.53	2.380	21 6 32.6	6.18	22 41.4
8	19 24 53.66	2.504	22 13 24.3	4.82	0 12.9	8	19 55 22.56	2.372	21 4 3.9	6.21	22 38.4
9	19 25 53.95	2.503	22 11 27.8	4.88	0 10.0	9	19 56 19.39	2.364	21 1 34.5	6.24	22 35.4
10	19 26 54.02	2.503	22 9 30.0	4.94	0 7.1	10	19 57 16.04	2.356	20 59 4.5	6.27	22 32.4
11	19 27 54.07	+2.502	-22 7 30.8	+4.99	0 4.2	11	19 58 12.48	+2.348	-20 56 33.8	+6.30	22 29.4
12	19 28 54.10	2.501	22 5 30.3	5.05	0 1.3	12	19 59 8.73	2.339	20 54 2.4	6.32	22 26.4
13	19 29 54.09	2.500	22 3 28.5	5.11	23 55.3	13	20 0 4.76	2.330	20 51 30.5	6.34	22 23.4
14	19 30 54.05	2.498	22 1 25.4	5.16	23 52.3	14	20 1 0.57	2.321	20 48 58.1	6.36	22 20.4
15	19 31 53.97	2.496	21 59 21.0	5.21	23 49.4	15	20 1 56.16	2.311	20 46 25.1	6.38	22 17.4
16	19 32 53.84	+2.494	-21 57 15.4	+5.26	23 46.4	16	20 2 51.52	+2.301	-20 43 51.6	+6.40	22 14.3
17	19 33 53.65	2.491	21 55 8.5	5.31	23 43.5	17	20 3 46.64	2.291	20 41 17.7	6.42	22 11.3
18	19 34 53.40	2.488	21 53 0.3	5.36	23 40.6	18	20 4 41.52	2.281	20 38 43.5	6.44	22 8.3
19	19 35 53.08	2.485	21 50 50.9	5.41	23 37.7	19	20 5 36.15	2.271	20 36 8.8	6.45	22 5.2
20	19 36 52.69	2.482	21 48 40.3	5.46	23 34.7	20	20 6 30.53	2.260	20 33 33.8	6.47	22 2.2
21	19 37 52.21	+2.479	-21 46 28.6	+5.51	23 31.8	21	20 7 24.64	+2.249	-20 30 58.5	+6.48	21 59.1
22	19 38 51.64	2.475	21 44 15.7	5.56	23 28.8	22	20 8 18.48	2.238	20 28 23.0	6.49	21 56.1
23	19 39 50.98	2.471	21 42 1.7	5.61	23 25.9	23	20 9 12.05	2.226	20 25 47.2	6.50	21 53.0
24	19 40 50.22	2.468	21 39 46.6	5.66	23 22.9	24	20 10 5.33	2.214	20 23 11.2	6.50	21 50.0
25	19 41 49.35	2.461	21 37 30.4	5.70	23 20.0	25	20 10 58.33	2.202	20 20 35.1	6.51	21 46.9
26	19 42 48.37	+2.456	-21 35 13.2	+5.74	23 17.0	26	20 11 51.04	+2.190	-20 17 58.9	+6.51	21 43.9
27	19 43 47.26	2.451	21 32 54.9	5.79	23 14.1	27	20 12 43.46	2.178	20 15 22.6	6.51	21 40.8
28	19 44 46.02	2.446	21 30 35.6	5.83	23 11.1	28	20 13 35.56	2.165	20 12 46.2	6.52	21 37.8
29	19 45 44.65	2.440	21 28 15.3	5.87	23 8.1	29	20 14 27.36	2.152	20 10 9.8	6.52	21 34.7
30	19 46 43.15	2.434	21 25 54.0	5.91	23 5.2	30	20 15 18.86	2.139	20 7 33.5	6.51	21 31.6
31	19 47 41.50	+2.428	-21 23 31.8	+5.95	23 2.2	31	20 16 10.02	+2.125	-20 4 57.3	+6.51	21 28.5
32	19 48 39.70	+2.422	-21 21 8.7	+5.98	22 59.3	32	20 17 0.87	+2.112	-20 2 21.1	+6.50	21 25.5
Day of the Month.	2d.	10th.	18th.	26th.		Day of the Month.	2d.	11th.	19th.	27th.	
Polar Semidiameter . .	15.3	15.3	15.4	15.4		Polar Semidiameter . .	15.5	15.6	15.8	16.0	
Horizontal Parallax . .	1.4	1.4	1.4	1.5		Horizontal Parallax . .	1.5	1.5	1.5	1.5	

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m	h m s	s	° ' "	
1	20 14 27.36	+2.152	−20 10 9.8	+6.52	21 34.7	1	20 38 10.83	+1.635	−18 52 54.9	+5.66	19 56.3
2	20 15 18.85	2.139	20 7 33.5	6.51	21 31.6	2	20 38 49.81	1.614	18 50 39.7	5.60	19 53.0
3	20 16 10.02	2.125	20 4 57.3	6.51	21 28.5	3	20 39 28.29	1.593	18 48 25.9	5.54	19 49.7
4	20 17 0.87	2.112	20 2 21.1	6.50	21 25.5	4	20 40 6.28	1.572	18 46 13.6	5.48	19 46.4
5	20 17 51.40	2.098	19 59 45.1	6.50	21 22.4	5	20 40 43.75	1.551	18 44 2.7	5.42	19 43.1
6	20 18 41.59	+2.084	−19 57 9.3	+6.49	21 19.3	6	20 41 20.72	+1.539	−18 41 53.3	+5.36	19 39.8
7	20 19 31.44	2.070	19 54 33.6	6.48	21 16.2	7	20 41 57.16	1.508	18 39 45.5	5.30	19 36.4
8	20 20 20.96	2.056	19 51 58.2	6.47	21 13.1	8	20 42 33.09	1.486	18 37 39.2	5.23	19 33.1
9	20 21 10.13	2.041	19 49 23.2	6.45	21 10.0	9	20 43 8.48	1.464	18 35 34.6	5.16	19 29.8
10	20 21 58.94	2.026	19 46 48.5	6.44	21 6.8	10	20 43 43.34	1.441	18 33 31.7	5.09	19 26.4
11	20 22 47.39	+2.011	−19 44 14.1	+6.43	21 3.7	11	20 44 17.65	+1.418	−18 31 30.5	+5.01	19 23.1
12	20 23 35.48	1.996	19 41 40.1	6.41	21 0.5	12	20 44 51.41	1.395	18 29 31.0	4.94	19 19.7
13	20 24 23.20	1.981	19 39 6.5	6.39	20 57.4	13	20 45 24.62	1.372	18 27 33.4	4.87	19 16.3
14	20 25 10.54	1.965	19 36 33.5	6.37	20 54.2	14	20 45 57.26	1.348	18 25 37.7	4.79	19 12.8
15	20 25 57.50	1.949	19 34 1.0	6.34	20 51.1	15	20 46 29.33	1.324	18 23 43.8	4.71	19 9.4
16	20 26 44.07	+1.932	−19 31 29.1	+6.32	20 47.9	16	20 47 0.82	+1.300	−18 21 51.9	+4.63	19 6.0
17	20 27 30.24	1.915	19 28 57.9	6.29	20 44.7	17	20 47 31.73	1.275	18 20 2.0	4.54	19 2.5
18	20 28 16.01	1.898	19 26 27.3	6.26	20 41.5	18	20 48 2.04	1.250	18 18 14.2	4.45	18 59.1
19	20 29 1.37	1.881	19 23 57.5	6.23	20 38.3	19	20 48 31.76	1.225	18 16 26.5	4.36	18 55.6
20	20 29 46.31	1.864	19 21 28.4	6.20	20 35.1	20	20 49 0.87	1.200	18 14 44.9	4.27	18 52.2
21	20 30 30.83	+1.846	−19 19 0.0	+6.16	20 31.9	21	20 49 29.37	+1.175	−18 13 3.5	+4.18	18 48.7
22	20 31 14.91	1.828	19 16 32.6	6.13	20 28.7	22	20 49 57.26	1.149	18 11 24.4	4.09	18 45.2
23	20 31 58.56	1.810	19 14 6.0	6.09	20 25.5	23	20 50 24.53	1.123	18 9 47.5	3.99	18 41.7
24	20 32 41.77	1.791	19 11 40.4	6.05	20 22.3	24	20 50 51.17	1.097	18 8 12.9	3.89	18 38.2
25	20 33 24.53	1.772	19 9 15.8	6.01	20 19.1	25	20 51 17.18	1.071	18 6 40.7	3.79	18 34.7
26	20 34 6.84	+1.753	−19 6 52.2	+5.97	20 15.9	26	20 51 42.55	+1.044	−18 5 10.9	+3.69	18 31.2
27	20 34 48.68	1.734	19 4 29.8	5.92	20 12.7	27	20 52 7.28	1.017	18 3 43.5	3.59	18 27.7
28	20 35 30.06	1.715	19 2 8.4	5.87	20 9.4	28	20 52 31.36	0.990	18 2 18.5	3.49	18 24.1
29	20 36 10.97	1.695	18 59 48.2	5.82	20 6.1	29	20 52 54.79	0.963	18 0 56.1	3.38	18 20.6
30	20 36 51.40	1.675	18 57 29.1	5.77	20 2.8	30	20 53 17.57	0.936	17 59 36.2	3.28	18 17.0
31	20 37 31.36	+1.655	−18 55 11.4	+5.72	19 59.6	31	20 53 39.68	+0.908	−17 58 18.9	+3.17	18 13.5
32	20 38 10.83	+1.635	−18 52 54.9	+5.66	19 56.3	32	20 54 1.13	+0.880	−17 57 4.2	+3.06	18 9.9
Day of the Month.						Day of the Month.					
Polar Semidiameter . . .						Polar Semidiameter					
Horizontal Parallax . . .						Horizontal Parallax					

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 53 39.68	+0.908	-17 58 18.9	+3.17	18 13.5	1	20 59 11.46	-0.039	-17 42 27.7	-0.75	16 16.8
2	20 54 1.13	0.890	17 57 4.2	3.06	18 9.9	2	20 59 10.14	0.071	17 42 47.3	0.89	16 12.9
3	20 54 21.91	0.852	17 55 52.1	2.95	18 6.3	3	20 59 8.05	0.103	17 43 10.1	1.02	16 8.9
4	20 54 42.02	0.824	17 54 42.7	2.84	18 2.7	4	20 59 5.20	0.135	17 43 36.2	1.15	16 4.9
5	20 55 1.45	0.795	17 53 36.1	2.73	17 59.1	5	20 59 1.59	0.167	17 44 5.4	1.29	16 0.9
6	20 55 20.19	+0.767	-17 52 32.1	+2.61	17 55.4	6	20 58 57.21	-0.199	-17 44 37.9	-1.42	15 56.9
7	20 55 38.25	0.738	17 51 31.0	2.49	17 51.8	7	20 58 52.06	0.230	17 45 13.5	1.55	15 52.9
8	20 55 55.60	0.709	17 50 32.6	2.37	17 48.3	8	20 58 46.15	0.262	17 45 52.3	1.69	15 48.8
9	20 56 12.26	0.680	17 49 37.0	2.25	17 44.5	9	20 58 39.48	0.294	17 46 34.3	1.81	15 44.8
10	20 56 28.21	0.650	17 48 44.5	2.13	17 40.8	10	20 58 32.05	0.326	17 47 19.4	1.94	15 40.7
11	20 56 43.44	+0.620	-17 47 54.8	+2.01	17 37.1	11	20 58 23.86	-0.358	-17 48 7.6	-2.07	15 36.6
12	20 56 57.96	0.590	17 47 8.1	1.89	17 33.4	12	20 58 14.91	0.389	17 48 58.9	2.20	15 32.5
13	20 57 11.75	0.560	17 46 24.3	1.76	17 29.7	13	20 58 5.20	0.420	17 49 53.3	2.33	15 28.4
14	20 57 24.82	0.529	17 45 43.5	1.63	17 26.0	14	20 57 54.75	0.451	17 50 50.8	2.46	15 24.3
15	20 57 37.14	0.499	17 45 5.8	1.51	17 22.2	15	20 57 43.56	0.482	17 51 51.2	2.59	15 20.2
16	20 57 48.73	+0.468	-17 44 31.1	+1.38	17 18.5	16	20 57 31.62	-0.513	-17 52 54.7	-2.71	15 16.1
17	20 57 59.58	0.437	17 43 59.6	1.25	17 14.7	17	20 57 18.94	0.543	17 54 1.1	2.83	15 11.9
18	20 58 9.69	0.406	17 43 31.1	1.12	17 10.9	18	20 57 5.55	0.573	17 55 10.3	2.95	15 7.8
19	20 58 19.04	0.375	17 43 5.8	0.99	17 7.2	19	20 56 51.43	0.603	17 56 22.5	3.06	15 3.6
20	20 58 27.63	0.343	17 42 43.6	0.86	17 3.4	20	20 56 36.61	0.632	17 57 37.4	3.18	14 59.4
21	20 58 35.48	+0.312	-17 42 24.6	+0.73	16 59.6	21	20 56 21.08	-0.661	-17 58 55.1	-3.29	14 55.2
22	20 58 42.57	0.280	17 42 8.8	0.60	16 55.7	22	20 56 4.86	0.690	18 0 15.5	3.40	14 51.0
23	20 58 48.89	0.248	17 41 56.2	0.46	16 51.9	23	20 55 47.96	0.718	18 1 38.6	3.51	14 46.8
24	20 58 54.46	0.216	17 41 46.8	0.33	16 48.1	24	20 55 30.38	0.746	18 3 4.2	3.62	14 42.5
25	20 58 59.26	0.184	17 41 40.6	0.20	16 44.2	25	20 55 12.14	0.774	18 4 32.4	3.73	14 38.3
26	20 59 3.30	+0.152	-17 41 37.6	+0.06	16 40.3	26	20 54 53.25	-0.801	-18 6 3.0	-3.83	14 34.1
27	20 59 6.57	0.120	17 41 37.9	-0.07	16 36.4	27	20 54 33.72	0.827	18 7 36.1	3.93	14 29.8
28	20 59 9.08	0.089	17 41 41.4	0.21	16 32.5	28	20 54 13.56	0.853	18 9 11.5	4.02	14 25.5
29	20 59 10.82	0.057	17 41 48.1	0.35	16 28.6	29	20 53 52.79	0.878	18 10 49.1	4.11	14 21.2
30	20 59 11.80	+0.025	17 41 58.1	0.48	16 24.7	30	20 53 31.41	0.903	18 12 29.0	4.20	14 17.0
31	20 59 12.01	-0.007	-17 42 11.3	-0.62	16 20.8	31	20 53 9.44	-0.928	-18 14 11.0	-4.29	14 12.6
32	20 59 11.46	-0.039	-17 42 27.7	-0.75	16 16.8	32	20 52 46.88	-0.952	-18 15 55.0	-4.38	14 8.3
Day of the Month.	2d.	10th.	18th.	26th.		Day of the Month.	2d.	11th.	19th.	27th.	
Polar Semidiameter . .	18.8	19.3	19.8	20.3		Polar Semidiameter . .	20.8	21.3	21.8	22.2	
Horizontal Parallax . .	1.8	1.8	1.9	1.9		Horizontal Parallax . .	2.0	2.0	2.1	2.1	

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 53 9.44	-0.986	-18 14 11.0	-4.99	14 12.6	1	20 38 21.67	-1.333	-19 17 3.9	-5.33	11 55.9
2	20 52 46.88	0.950	18 15 55.0	4.38	14 8.3	2	20 37 49.91	1.329	19 19 9.3	5.90	11 51.5
3	20 52 23.75	0.975	18 17 41.0	4.46	14 4.0	3	20 37 18.19	1.330	19 21 13.9	5.17	11 47.0
4	20 52 0.07	0.998	18 19 28.9	4.54	13 59.7	4	20 36 46.55	1.317	19 23 17.6	5.13	11 42.5
5	20 51 35.85	1.020	18 21 18.6	4.61	13 55.4	5	20 36 15.00	1.313	19 25 20.3	5.09	11 38.1
6	20 51 11.10	-1.049	-18 23 10.2	-4.68	13 51.0	6	20 35 43.56	-1.307	-19 27 22.1	-5.05	11 33.6
7	20 50 45.83	1.063	18 25 3.5	4.75	13 46.7	7	20 35 12.26	1.301	19 29 22.7	5.00	11 29.2
8	20 50 20.07	1.083	18 26 58.4	4.82	13 42.3	8	20 34 41.11	1.294	19 31 22.2	4.95	11 24.7
9	20 49 53.83	1.103	18 28 54.8	4.88	13 37.9	9	20 34 10.15	1.288	19 33 20.5	4.90	11 20.3
10	20 49 27.11	1.129	18 30 52.7	4.94	13 33.5	10	20 33 39.40	1.277	19 35 17.4	4.84	11 15.9
11	20 48 59.95	-1.140	-18 32 51.9	-4.99	13 29.2	11	20 33 8.88	-1.267	-19 37 12.9	-4.78	11 11.4
12	20 48 32.35	1.158	18 34 52.4	5.04	13 24.8	12	20 32 38.60	1.256	19 39 6.9	4.72	11 7.0
13	20 48 4.34	1.175	18 36 54.0	5.09	13 20.4	13	20 32 8.60	1.244	19 40 59.4	4.65	11 2.6
14	20 47 35.93	1.199	18 38 56.8	5.13	13 16.0	14	20 31 38.90	1.231	19 42 50.3	4.58	10 58.2
15	20 47 7.14	1.207	18 41 0.6	5.17	13 11.5	15	20 31 9.53	1.217	19 44 39.4	4.51	10 53.7
16	20 46 38.01	-1.221	-18 43 5.2	-5.21	13 7.1	16	20 30 40.50	-1.202	-19 46 26.8	-4.44	10 49.3
17	20 46 8.54	1.235	18 45 10.7	5.24	13 2.7	17	20 30 11.83	1.186	19 48 12.4	4.36	10 44.9
18	20 45 38.76	1.246	18 47 16.9	5.27	12 58.3	18	20 29 43.55	1.170	19 49 56.1	4.28	10 40.5
19	20 45 8.69	1.259	18 49 23.7	5.29	12 53.8	19	20 29 15.69	1.152	19 51 37.8	4.20	10 36.1
20	20 44 38.35	1.269	18 51 31.1	5.31	12 49.4	20	20 28 48.26	1.134	19 53 17.5	4.12	10 31.8
21	20 44 7.76	-1.279	-18 53 38.8	-5.33	12 45.0	21	20 28 21.27	-1.115	-19 54 55.2	-4.03	10 27.4
22	20 43 36.96	1.288	18 55 46.8	5.34	12 40.5	22	20 27 54.75	1.094	19 56 30.8	3.94	10 23.0
23	20 43 5.95	1.295	18 57 55.1	5.34	12 36.1	23	20 27 28.73	1.073	19 58 4.1	3.85	10 18.7
24	20 42 34.77	1.309	19 0 3.5	5.35	12 31.6	24	20 27 3.21	1.052	19 59 35.3	3.75	10 14.3
25	20 42 3.43	1.308	19 2 12.0	5.35	12 27.2	25	20 26 38.21	1.030	20 1 4.3	3.66	10 10.0
26	20 41 31.97	-1.313	-19 4 20.3	-5.34	12 22.7	26	20 26 13.74	-1.007	-20 2 30.9	-3.56	10 5.6
27	20 41 0.39	1.317	19 6 28.5	5.33	12 18.3	27	20 25 49.84	0.984	20 3 55.2	3.46	10 1.3
28	20 40 24.73	1.320	19 8 36.4	5.32	12 13.8	28	20 25 26.50	0.960	20 5 17.2	3.36	9 57.0
29	20 39 57.00	1.322	19 10 44.1	5.30	12 9.3	29	20 25 3.75	0.935	20 6 36.7	3.26	9 52.7
30	20 39 25.24	1.323	19 12 51.2	5.28	12 4.9	30	20 24 41.60	0.910	20 7 53.9	3.16	9 48.4
31	20 38 53.45	-1.324	-19 14 57.9	-5.26	12 0.4	31	20 24 20.06	-0.884	-20 9 8.5	-3.06	9 44.1
32	20 38 21.67	-1.323	-19 17 3.9	-5.23	11 55.9	32	20 23 59.14	-0.858	-20 10 20.7	-2.95	9 39.9
Day of the Month.	5th.	13th.	21st.	29th.		Day of the Month.	6th.	14th.	22d.	30th.	
Polar Semidiameter . .	22' 6	22' 9	23' 0	23' 1		Polar Semidiameter . .	23' 1	22' 9	22' 7	22' 4	
Horizontal Parallax . .	2.1	2.1	2.2	2.2		Horizontal Parallax . .	2.2	2.2	2.1	2.1	

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.						
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>	
1	20 23 59.14	-0.858	-20 10 20.7	-2.96	9 39.9	1	20 19 13.66	+0.102	-20 25 44.0	+0.44	7 37.3	
2	20 23 38.86	0.831	20 11 30.4	2.86	9 35.6	2	20 19 16.51	0.136	20 25 32.2	0.55	7 33.4	
3	20 23 19.23	0.804	20 12 37.6	2.75	9 31.3	3	20 19 20.17	0.170	20 25 17.6	0.67	7 29.6	
4	20 23 0.27	0.776	20 13 42.2	2.64	9 27.1	4	20 19 24.65	0.204	20 25 0.3	0.78	7 25.7	
5	20 22 41.99	0.748	20 14 44.2	2.53	9 22.9	5	20 19 29.94	0.237	20 24 40.2	0.89	7 21.9	
6	20 22 24.39	-0.719	-20 15 43.6	-2.42	9 18.7	6	20 19 36.04	+0.271	-20 24 17.4	+1.01	7 18.1	
7	20 22 7.49	0.690	20 16 40.4	2.31	9 14.5	7	20 19 42.95	0.305	20 23 51.9	1.12	7 14.2	
8	20 21 51.30	0.659	20 17 34.5	2.20	9 10.3	8	20 19 50.66	0.338	20 23 23.6	1.22	7 10.4	
9	20 21 35.84	0.629	20 18 26.0	2.09	9 6.1	9	20 19 59.19	0.372	20 22 52.7	1.35	7 6.6	
10	20 21 21.10	0.598	20 19 14.8	1.98	9 1.9	10	20 20 8.52	0.405	20 22 19.0	1.46	7 2.9	
11	20 21 7.11	-0.567	-20 20 0.9	-1.86	8 57.7	11	20 20 18.66	+0.439	-20 21 42.6	+1.57	6 59.1	
12	20 20 53.90	0.535	20 20 44.3	1.75	8 53.6	12	20 20 29.59	0.472	20 21 3.6	1.69	6 55.4	
13	20 20 41.44	0.503	20 21 25.0	1.64	8 49.5	13	20 20 41.32	0.505	20 20 21.8	1.80	6 51.6	
14	20 20 29.75	0.471	20 22 2.9	1.52	8 45.3	14	20 20 53.83	0.538	20 19 37.3	1.91	6 47.9	
15	20 20 18.83	0.438	20 22 38.1	1.41	8 41.2	15	20 21 7.14	0.571	20 18 50.2	2.03	6 44.2	
16	20 20 8.71	-0.405	-20 23 10.5	-1.30	8 37.1	16	20 21 21.23	+0.603	-20 18 0.3	+2.14	6 40.5	
17	20 19 59.37	0.372	20 23 40.1	1.18	8 33.1	17	20 21 36.09	0.635	20 17 7.8	2.25	6 36.8	
18	20 19 50.83	0.339	20 24 7.0	1.07	8 29.0	18	20 21 51.72	0.667	20 16 12.6	2.36	6 33.2	
19	20 19 43.09	0.306	20 24 31.1	0.95	8 24.9	19	20 22 8.12	0.699	20 15 14.7	2.47	6 29.5	
20	20 19 36.16	0.272	20 24 52.5	0.83	8 20.9	20	20 22 25.25	0.730	20 14 14.2	2.58	6 25.9	
21	20 19 30.04	-0.239	-20 25 11.0	-0.71	8 16.9	21	20 22 43.18	+0.761	-20 13 11.1	+2.69	6 22.2	
22	20 19 24.73	0.205	20 25 26.8	0.59	8 12.9	22	20 23 1.83	0.792	20 12 5.3	2.80	6 18.6	
23	20 19 20.24	0.171	20 25 39.8	0.48	8 8.9	23	20 23 21.22	0.823	20 10 56.9	2.91	6 15.0	
24	20 19 16.56	0.137	20 25 50.0	0.36	8 4.9	24	20 23 41.34	0.853	20 9 45.8	3.02	6 11.4	
25	20 19 13.70	0.102	20 25 57.4	0.25	8 0.9	25	20 24 2.19	0.883	20 8 32.2	3.13	6 7.8	
26	20 19 11.65	-0.068	-20 26 2.1	-0.14	7 56.9	26	20 24 23.75	+0.913	-20 7 15.9	+3.23	6 4.3	
27	20 19 10.42	-0.034	20 26 4.0	-0.02	7 53.0	27	20 24 46.01	0.942	20 5 57.1	3.34	6 0.7	
28	20 19 10.00	0.000	20 26 3.1	+0.10	7 49.0	28	20 25 8.98	0.971	20 4 35.8	3.45	5 57.1	
29	20 19 10.41	+0.034	20 25 59.5	0.21	7 45.1	29	20 25 32.64	1.000	20 3 11.8	3.55	5 53.6	
30	20 19 11.62	0.068	20 25 53.2	0.33	7 41.2	30	20 25 56.99	1.029	20 1 45.3	3.66	5 50.1	
31	20 19 13.66	+0.102	-20 25 44.0	+0.44	7 37.3	31	20 26 22.02	+1.057	-20 0 16.2	+3.77	5 46.6	
32	20 19 16.51	+0.136	-20 25 32.2	+0.55	7 33.4	32	20 26 47.73	+1.085	-19 58 44.6	+3.87	5 43.1	
Day of the Month.			7th.	15th.	22d.	Day of the Month.			1st.	9th.	17th.	25th.
Polar Semidiameter			22".0	21".6	21".1	Polar Semidiameter			20".6	20".1	19".6	19".1
Horizontal Parallax			2.1	2.0	2.0	Horizontal Parallax			1.9	1.9	1.8	1.8

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.												
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.							
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.								
	^h ^m ^s	^s	^o ' "	"	^h ^m		^h ^m ^s	^s	^o ' "	"	^h ^m							
1	20 26 47.73	+1.065	-19 58 44.6	+3.87	5 43.1	1	20 44 16.45	+1.777	-18 53 45.4	+6.90	4 2.5							
2	20 27 14.10	1.113	19 57 10.5	3.98	5 39.6	2	20 44 59.33	1.795	18 50 58.6	7.00	3 59.3							
3	20 27 41.13	1.140	19 55 33.8	4.09	5 36.1	3	20 45 42.63	1.813	18 48 9.5	7.10	3 56.1							
4	20 28 8.82	1.167	19 53 54.5	4.19	5 32.7	4	20 46 26.35	1.831	18 45 18.2	7.19	3 52.9							
5	20 28 37.16	1.194	19 52 12.8	4.30	5 29.2	5	20 47 10.49	1.848	18 42 24.6	7.29	3 49.7							
6	20 29 6.14	+1.221	-19 50 28.5	+4.40	5 25.8	6	20 47 55.04	+1.865	-18 39 28.8	+7.38	3 46.5							
7	20 29 35.76	1.247	19 48 41.7	4.50	5 22.3	7	20 48 39.99	1.881	18 36 30.7	7.47	3 43.3							
8	20 30 6.00	1.273	19 46 52.4	4.61	5 18.9	8	20 49 25.33	1.897	18 33 30.4	7.56	3 40.2							
9	20 30 36.87	1.299	19 45 0.7	4.71	5 15.4	9	20 50 11.06	1.913	18 30 27.9	7.65	3 37.0							
10	20 31 8.34	1.324	19 43 6.4	4.81	5 12.0	10	20 50 57.17	1.929	18 27 23.2	7.74	3 33.8							
11	20 31 40.43	+1.349	-19 41 9.6	+4.92	5 8.6	11	20 51 43.64	+1.944	-18 24 16.3	+7.83	3 30.6							
12	20 32 13.12	1.374	19 39 10.4	5.02	5 5.2	12	20 52 30.47	1.959	18 21 7.2	7.92	3 27.5							
13	20 32 46.39	1.399	19 37 8.6	5.12	5 1.8	13	20 53 17.66	1.973	18 17 56.0	8.01	3 24.3							
14	20 33 20.25	1.423	19 35 4.4	5.23	4 58.5	14	20 54 5.19	1.987	18 14 42.6	8.10	3 21.2							
15	20 33 54.68	1.447	19 32 57.7	5.33	4 55.1	15	20 54 53.06	2.001	18 11 27.2	8.19	3 18.0							
16	20 34 29.68	+1.470	-19 30 48.5	+5.43	4 51.7	16	20 55 41.26	+2.015	-18 8 9.5	+8.26	3 14.9							
17	20 35 5.23	1.493	19 28 37.0	5.53	4 48.4	17	20 56 29.78	2.028	18 4 49.8	8.37	3 11.8							
18	20 35 41.32	1.516	19 26 23.0	5.63	4 45.1	18	20 57 18.62	2.041	18 1 28.0	8.45	3 8.7							
19	20 36 17.96	1.538	19 24 6.6	5.73	4 41.8	19	20 58 7.75	2.054	17 58 4.2	8.53	3 5.6							
20	20 36 55.13	1.560	19 21 47.8	5.83	4 38.5	20	20 58 57.19	2.066	17 54 38.3	8.62	3 2.5							
21	20 37 32.81	+1.581	-19 19 26.6	+5.93	4 35.2	21	20 59 46.91	+2.078	-17 51 10.4	+8.70	2 59.4							
22	20 38 11.01	1.602	19 17 3.0	6.03	4 31.9	22	21 0 36.91	2.089	17 47 40.6	8.78	2 56.3							
23	20 38 49.71	1.623	19 14 37.0	6.13	4 28.6	23	21 1 27.19	2.100	17 44 8.7	8.87	2 53.2							
24	20 39 28.90	1.643	19 12 8.7	6.23	4 25.3	24	21 2 17.73	2.111	17 40 34.9	8.95	2 50.1							
25	20 40 8.58	1.663	19 9 38.0	6.33	4 22.0	25	21 3 8.54	2.122	17 36 59.2	9.03	2 47.0							
26	20 40 48.74	+1.683	-19 7 5.0	+6.43	4 18.8	26	21 3 59.60	+2.133	-17 33 21.5	+9.11	2 43.9							
27	20 41 29.37	1.703	19 4 29.7	6.53	4 15.5	27	21 4 50.91	2.143	17 29 41.9	9.19	2 40.8							
28	20 42 10.46	1.722	19 1 52.1	6.62	4 12.3	28	21 5 42.47	2.153	17 26 0.4	9.27	2 37.7							
29	20 42 52.01	1.741	18 59 12.2	6.72	4 9.0	29	21 6 34.26	2.163	17 22 17.0	9.35	2 34.6							
30	20 43 34.01	1.759	18 56 29.9	6.81	4 5.8	30	21 7 26.28	2.172	17 18 31.7	9.43	2 31.6							
31	20 44 16.45	+1.777	-18 53 45.4	+6.90	4 2.5	31	21 8 18.52	+2.181	-17 14 44.6	+9.50	2 28.5							
32	20 44 59.33	+1.795	-18 50 58.6	+7.00	3 59.3	32	21 9 10.98	+2.190	-17 10 55.7	+9.58	2 25.5							
Day of the Month.					2d.	10th.	18th.	26th.	Day of the Month.					4th.	12th.	20th.	28th.	36th.
Polar Semidiameter . .					18".6	18".2	17".8	17".4	Polar Semidiameter . .					17".0	16".7	16".5	16".3	16".1
Horizontal Parallax . .					1.7	1.7	1.7	1.6	Horizontal Parallax . .					1.6	1.6	1.5	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	^o ['] ["]	["]	^h ^m		^h ^m ^s	^s	^o ['] ["]	["]	^h ^m
1	10 24 26.46	-0.298	+11 39 17.7	+2.32	15 37.5	1	10 18 0.47	-0.686	+12 22 23.7	+4.32	13 29.1
2	10 24 19.11	0.314	11 40 14.6	2.41	15 33.4	2	10 17 43.70	0.703	12 24 7.9	4.35	13 24.9
3	10 24 11.36	0.330	11 41 13.5	2.50	15 29.3	3	10 17 26.75	0.710	12 25 52.8	4.38	13 20.7
4	10 24 3.23	0.346	11 42 14.6	2.59	15 25.3	4	10 17 9.64	0.717	12 27 38.3	4.41	13 16.4
5	10 23 54.73	0.362	11 43 17.7	2.68	15 21.2	5	10 16 52.36	0.723	12 29 24.4	4.43	13 12.2
6	10 23 45.85	-0.378	+11 44 22.8	+2.76	15 17.1	6	10 16 34.93	-0.729	+12 31 11.1	+4.45	13 8.0
7	10 23 36.59	0.393	11 45 30.0	2.84	15 13.0	7	10 16 17.35	0.735	12 32 58.3	4.47	13 3.8
8	10 23 26.97	0.408	11 46 39.1	2.92	15 8.9	8	10 15 59.65	0.740	12 34 45.9	4.49	12 59.5
9	10 23 16.98	0.423	11 47 50.1	3.00	15 4.8	9	10 15 41.82	0.745	12 36 33.9	4.50	12 55.3
10	10 23 6.64	0.438	11 49 3.1	3.08	15 0.7	10	10 15 23.88	0.749	12 38 22.1	4.51	12 51.1
11	10 22 55.93	-0.453	+11 50 17.9	+3.16	14 56.6	11	10 15 5.84	-0.753	+12 40 10.6	+4.52	12 46.9
12	10 22 44.87	0.468	11 51 34.5	3.24	14 52.5	12	10 14 47.70	0.757	12 41 59.3	4.53	12 42.6
13	10 22 33.48	0.482	11 52 53.0	3.31	14 48.4	13	10 14 29.48	0.761	12 43 48.1	4.54	12 38.4
14	10 22 21.74	0.496	11 54 13.2	3.38	14 44.2	14	10 14 11.19	0.764	12 45 37.0	4.54	12 34.1
15	10 22 9.67	0.510	11 55 35.1	3.45	14 40.1	15	10 13 52.84	0.766	12 47 25.9	4.53	12 29.9
16	10 21 57.28	-0.523	+11 56 58.7	+3.52	14 35.9	16	10 13 34.44	-0.768	+12 49 14.7	+4.53	12 25.7
17	10 21 44.56	0.536	11 58 24.0	3.59	14 31.8	17	10 13 15.99	0.769	12 51 3.4	4.52	12 21.4
18	10 21 31.53	0.549	11 59 50.8	3.65	14 27.7	18	10 12 57.52	0.770	12 52 51.9	4.50	12 17.2
19	10 21 18.18	0.562	12 1 19.1	3.71	14 23.5	19	10 12 39.03	0.770	12 54 40.2	4.51	12 13.0
20	10 21 4.54	0.575	12 2 48.9	3.77	14 19.3	20	10 12 20.53	0.770	12 56 28.2	4.49	12 8.7
21	10 20 50.61	-0.587	+12 4 20.2	+3.83	14 15.2	21	10 12 2.03	-0.770	+12 58 15.8	+4.47	12 4.5
22	10 20 36.40	0.599	12 5 52.9	3.89	14 11.0	22	10 11 43.56	0.769	13 0 2.9	4.45	12 0.2
23	10 20 21.90	0.610	12 7 26.9	3.95	14 6.8	23	10 11 25.11	0.768	13 1 49.6	4.43	11 56.0
24	10 20 7.14	0.621	12 9 2.2	4.00	14 2.6	24	10 11 6.70	0.767	13 3 35.7	4.41	11 51.8
25	10 19 52.12	0.632	12 10 38.7	4.05	13 58.5	25	10 10 48.34	0.765	13 5 21.1	4.38	11 47.5
26	10 19 36.85	-0.642	+12 12 16.4	+4.10	13 54.3	26	10 10 30.03	-0.762	+13 7 6.0	+4.35	11 43.3
27	10 19 21.33	0.652	12 13 55.2	4.14	13 50.1	27	10 10 11.79	0.759	13 8 50.2	4.32	11 39.1
28	10 19 5.58	0.661	12 15 35.0	4.18	13 45.9	28	10 9 53.64	0.755	13 10 33.5	4.29	11 34.8
29	10 18 49.61	0.670	12 17 15.8	4.22	13 41.7	29	10 9 35.57	0.751	13 12 15.9	4.25	11 30.6
30	10 18 33.43	0.679	12 18 57.6	4.26	13 37.5	30	10 9 17.61	0.747	13 13 57.5	4.21	11 26.4
31	10 18 17.05	-0.687	+12 20 40.2	+4.29	13 33.3	31	10 8 59.75	-0.742	+13 15 38.2	+4.17	11 22.1
32	10 18 0.47	-0.695	+12 22 23.7	+4.32	13 29.1	32	10 8 42.01	-0.737	+13 17 17.9	+4.13	11 17.9
Day of the Month.						Day of the Month.					
		2d.	10th.	18th.	26th.			2d.	11th.	19th.	27th.
Polar Semidiameter . .		9".1	9".2	9".3	9".4	Polar Semidiameter . .		9".4	9".4	9".5	9".4
Horizontal Parallax . .		1.0	1.0	1.1	1.1	Horizontal Parallax . .		1.1	1.1	1.1	1.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

GREENWICH MEAN TIME.											
MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>
1	10 9 35.57	-0.751	+13 12 15.9	+4.25	11 30.6	1	10 1 49.52	-0.448	+13 54 9.9	+2.26	9 21.0
2	10 9 17.61	0.747	13 13 57.5	4.21	11 26.4	2	10 1 38.95	0.434	13 55 2.9	2.17	9 16.9
3	10 8 59.75	0.743	13 15 38.2	4.17	11 22.1	3	10 1 28.73	0.419	13 55 53.9	2.08	9 12.8
4	10 8 42.01	0.737	13 17 17.9	4.13	11 17.9	4	10 1 18.85	0.404	13 56 42.7	1.99	9 8.7
5	10 8 24.40	0.731	13 18 56.5	4.09	11 13.7	5	10 1 9.33	0.389	13 57 29.4	1.91	9 4.7
6	10 8 6.92	-0.725	+13 20 34.1	+4.04	11 9.5	6	10 0 0.19	-0.374	+13 58 14.0	+1.82	9 0.6
7	10 7 49.60	0.719	13 22 10.5	3.99	11 5.2	7	10 0 51.40	0.369	13 58 56.6	1.73	8 56.5
8	10 7 32.43	0.712	13 23 45.7	3.94	11 1.0	8	10 0 42.98	0.343	13 59 37.0	1.64	8 52.4
9	10 7 15.42	0.705	13 25 19.7	3.89	10 56.8	9	10 0 34.93	0.327	14 0 15.2	1.55	8 48.4
10	10 6 58.58	0.698	13 26 52.5	3.84	10 52.6	10	10 0 27.26	0.311	14 0 51.3	1.46	8 44.3
11	10 6 41.93	-0.690	+13 28 23.9	+3.78	10 48.4	11	10 0 19.97	-0.295	+14 1 25.2	+1.37	8 40.3
12	10 6 25.47	0.682	13 29 54.0	3.72	10 44.2	12	10 0 13.06	0.279	14 1 57.0	1.28	8 36.2
13	10 6 9.21	0.673	13 31 22.7	3.66	10 40.0	13	10 0 6.54	0.263	14 2 26.5	1.19	8 32.2
14	10 5 53.16	0.664	13 32 49.9	3.60	10 35.8	14	10 0 0.41	0.247	14 2 53.8	1.09	8 28.2
15	10 5 37.33	0.655	13 34 15.7	3.54	10 31.6	15	9 59 54.66	0.231	14 3 19.0	1.00	8 24.1
16	10 5 21.73	-0.645	+13 35 39.9	+3.48	10 27.4	16	9 59 49.35	-0.215	+14 3 41.8	+0.91	8 20.1
17	10 5 6.37	0.635	13 37 2.5	3.41	10 23.2	17	9 59 44.41	0.198	14 4 2.4	0.82	8 16.1
18	10 4 51.24	0.625	13 38 23.6	3.34	10 19.1	18	9 59 39.87	0.181	14 4 20.8	0.73	8 12.1
19	10 4 36.37	0.614	13 39 43.0	3.27	10 14.9	19	9 59 35.74	0.164	14 4 37.0	0.63	8 8.1
20	10 4 21.76	0.603	13 41 0.7	3.20	10 10.7	20	9 59 32.01	0.147	14 4 51.0	0.54	8 4.1
21	10 4 7.42	-0.591	+13 42 16.7	+3.13	10 6.5	21	9 59 28.70	-0.130	+14 5 2.6	+0.45	8 0.1
22	10 3 53.36	0.579	13 43 31.0	3.06	10 2.4	22	9 59 25.79	0.113	14 5 12.0	0.35	7 56.1
23	10 3 39.58	0.567	13 44 43.4	2.99	9 58.2	23	9 59 23.30	0.096	14 5 19.2	0.26	7 52.2
24	10 3 26.09	0.555	13 45 54.0	2.91	9 54.1	24	9 59 21.21	0.078	14 5 24.1	0.16	7 48.2
25	10 3 12.91	0.543	13 47 2.8	2.83	9 49.9	25	9 59 19.53	0.061	14 5 26.7	+0.07	7 44.2
26	10 3 0.03	-0.530	+13 48 9.7	+2.75	9 45.8	26	9 59 18.28	-0.043	+14 5 27.0	-0.03	7 40.3
27	10 2 47.47	0.517	13 49 14.6	2.67	9 41.6	27	9 59 17.43	0.026	14 5 25.1	0.12	7 36.4
28	10 2 35.22	0.504	13 50 17.6	2.59	9 37.5	28	9 59 16.99	-0.009	14 5 21.0	0.22	7 32.4
29	10 2 23.30	0.490	13 51 18.7	2.51	9 33.4	29	9 59 16.97	+0.008	14 5 14.6	0.31	7 28.5
30	10 2 11.70	0.476	13 52 17.8	2.42	9 29.3	30	9 59 17.35	0.025	14 5 6.0	0.41	7 24.6
31	10 2 0.44	-0.462	+13 53 14.8	+2.34	9 25.1	31	9 59 18.15	+0.042	+14 4 55.2	-0.50	7 20.6
32	10 1 49.52	-0.448	+13 54 9.9	+2.26	9 21.0	32	9 59 19.35	+0.059	+14 4 42.1	-0.50	7 16.7
Day of the Month.						Day of the Month.					
7th.						8th.					
15th.						16th.					
23d.						24th.					
31st.											
Polar Semidiameter . .						Polar Semidiameter					
Horizontal Parallax . .						Horizontal Parallax					
9".4						9".1					
1.1						1.0					
9".4						9".0					
1.1						1.0					
9".3						9".8					
1.1						1.0					
9".2											
1.0											

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]			^h ^m ^s	^s	[°] ['] ["]	["]	
1	9 59 18.15	+0.042	+14 4 55.2	-0.50	7 20.6	1	10 2 59.96	+0.541	+13 41 39.6	-3.18	5 22.5
2	9 59 19.35	0.059	14 4 42.1	0.59	7 16.7	2	10 3 13.11	0.555	13 40 22.4	3.98	5 18.8
3	9 59 20.97	0.076	14 4 26.8	0.69	7 12.8	3	10 3 26.61	0.569	13 39 3.4	3.33	5 15.1
4	9 59 22.99	0.093	14 4 9.3	0.78	7 8.9	4	10 3 40.45	0.583	13 37 42.6	3.41	5 11.4
5	9 59 25.42	0.110	14 3 49.7	0.87	7 5.1	5	10 3 54.61	0.597	13 36 30.0	3.49	5 7.7
6	9 59 28.26	+0.127	+14 3 27.5	-0.96	7 1.2	6	10 4 9.11	+0.611	+13 34 55.6	-3.56	5 4.0
7	9 59 31.50	0.144	14 3 3.7	1.05	6 57.3	7	10 4 23.94	0.625	13 33 29.4	3.63	5 0.3
8	9 59 35.14	0.161	14 2 37.5	1.14	6 53.4	8	10 4 39.09	0.638	13 32 1.5	3.70	4 56.6
9	9 59 39.19	0.177	14 2 9.1	1.23	6 49.5	9	10 4 54.56	0.652	13 30 31.8	3.78	4 52.9
10	9 59 43.64	0.194	14 1 38.5	1.32	6 45.7	10	10 5 10.37	0.665	13 29 0.3	3.85	4 49.2
11	9 59 48.50	+0.211	+14 1 5.7	-1.41	6 41.8	11	10 5 26.48	+0.678	+13 27 27.1	-3.92	4 45.6
12	9 59 53.75	0.228	14 0 30.8	1.50	6 38.0	12	10 5 42.91	0.691	13 25 52.2	3.99	4 41.9
13	9 59 59.40	0.244	13 59 53.8	1.59	6 34.2	13	10 5 59.65	0.704	13 24 15.7	4.06	4 38.3
14	10 0 5.45	0.260	13 59 14.7	1.67	6 30.3	14	10 6 16.69	0.717	13 22 37.5	4.13	4 34.6
15	10 0 11.90	0.277	13 58 33.4	1.76	6 26.5	15	10 6 34.04	0.730	13 20 57.6	4.20	4 31.0
16	10 0 18.75	+0.293	+13 57 50.1	-1.85	6 22.7	16	10 6 51.69	+0.742	+13 19 16.1	-4.27	4 27.3
17	10 0 25.98	0.310	13 57 4.6	1.94	6 18.9	17	10 7 9.64	0.754	13 17 33.0	4.34	4 23.7
18	10 0 33.61	0.326	13 56 17.1	2.03	6 15.1	18	10 7 27.87	0.768	13 15 48.3	4.40	4 20.1
19	10 0 41.63	0.342	13 55 27.4	2.11	6 11.3	19	10 7 46.40	0.778	13 14 1.9	4.47	4 16.5
20	10 0 50.03	0.358	13 54 35.7	2.20	6 7.5	20	10 8 5.21	0.790	13 12 14.0	4.54	4 12.9
21	10 0 58.81	+0.374	+13 53 42.0	-2.29	6 3.7	21	10 8 24.29	+0.801	+13 10 24.6	-4.60	4 9.3
22	10 1 7.98	0.390	13 52 46.2	2.37	5 59.9	22	10 8 43.65	0.812	13 8 33.7	4.66	4 5.7
23	10 1 17.53	0.406	13 51 48.4	2.45	5 56.1	23	10 9 3.30	0.823	13 6 41.2	4.72	4 2.1
24	10 1 27.45	0.421	13 50 48.5	2.53	5 52.4	24	10 9 23.20	0.834	13 4 47.3	4.78	3 58.5
25	10 1 37.74	0.437	13 49 46.7	2.62	5 48.6	25	10 9 43.36	0.845	13 2 52.0	4.84	3 54.9
26	10 1 48.42	+0.452	+13 48 42.9	-2.70	5 44.9	26	10 10 3.77	+0.856	+13 0 55.1	-4.90	3 51.3
27	10 1 59.45	0.467	13 47 37.2	2.78	5 41.1	27	10 10 24.45	0.867	12 58 56.9	4.96	3 47.7
28	10 2 10.84	0.482	13 46 29.5	2.86	5 37.4	28	10 10 45.37	0.877	12 56 57.3	5.01	3 44.1
29	10 2 22.59	0.497	13 45 19.9	2.94	5 33.6	29	10 11 6.53	0.887	12 54 56.3	5.07	3 40.5
30	10 2 34.70	0.512	13 44 8.3	3.02	5 29.9	30	10 11 27.94	0.897	12 52 53.9	5.13	3 36.9
31	10 2 47.16	+0.527	+13 42 54.9	-3.10	5 26.2	31	10 11 49.59	+0.907	+12 50 50.2	-5.19	3 33.3
32	10 2 59.96	+0.541	+13 41 39.6	-3.18	5 22.5	32	10 12 11.47	+0.917	+12 48 45.0	-5.24	3 29.7
Day of the Month.						Day of the Month.					
2d.						2d.					
10th.						10th.					
18th.						18th.					
26th.						26th.					
Polar Semidiameter . .						Polar Semidiameter . .					
Horizontal Parallax . .						Horizontal Parallax . .					
8".7						8".7					
1.0						1.0					
8".6						8".6					
1.0						1.0					
8".5						8".5					
1.0						1.0					
8".4						8".4					
0.9						0.9					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.						
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	10 11 49.50	+0.907	+12 50 50.2	-5.19	3 33.3	1	10 24 37.35	+1.130	+11 37 35.4	-6.49	1 44.2	
2	10 12 11.47	0.917	12 48 45.1	5.94	3 29.7	2	10 25 4.52	1.134	11 34 59.2	6.59	1 40.7	
3	10 12 33.57	0.936	12 46 38.8	5.99	3 26.2	3	10 25 31.80	1.139	11 32 22.3	6.55	1 37.3	
4	10 12 55.90	0.935	12 44 31.2	5.35	3 22.6	4	10 25 59.19	1.143	11 29 44.9	6.58	1 33.8	
5	10 13 18.45	0.944	12 42 22.4	5.40	3 19.1	5	10 26 26.67	1.147	11 27 6.8	6.61	1 30.3	
6	10 13 41.23	+0.953	+12 40 12.2	-5.45	3 15.5	6	10 26 54.25	+1.151	+11 24 25.0	-6.63	1 26.8	
7	10 14 4.22	0.962	12 38 0.9	5.50	3 12.0	7	10 27 21.94	1.155	11 21 48.7	6.65	1 23.4	
8	10 14 27.42	0.971	12 35 48.3	5.55	3 8.4	8	10 27 49.70	1.159	11 19 8.9	6.68	1 19.9	
9	10 14 50.83	0.980	12 33 34.6	5.60	3 4.9	9	10 28 17.55	1.169	11 16 28.5	6.70	1 16.4	
10	10 15 14.44	0.988	12 31 19.7	5.65	3 1.4	10	10 28 45.48	1.165	11 13 47.5	6.72	1 12.9	
11	10 15 38.25	+0.996	+12 29 3.6	-5.70	2 57.8	11	10 29 13.49	+1.168	+11 11 6.0	-6.74	1 9.5	
12	10 16 2.26	1.004	12 26 46.4	5.75	2 54.2	12	10 29 41.57	1.171	11 8 24.1	6.76	1 6.0	
13	10 16 26.46	1.019	12 24 28.1	5.79	2 50.7	13	10 30 9.71	1.174	11 5 41.8	6.78	1 2.6	
14	10 16 50.86	1.030	12 22 8.6	5.84	2 47.2	14	10 30 37.93	1.177	11 2 59.0	6.80	0 59.1	
15	10 17 15.44	1.038	12 19 48.1	5.89	2 43.7	15	10 31 6.22	1.180	11 0 15.7	6.82	0 55.7	
16	10 17 40.20	+1.035	+12 17 26.5	-5.93	2 40.2	16	10 31 34.55	+1.182	+10 57 32.2	-6.83	0 52.2	
17	10 18 5.13	1.042	12 15 3.8	5.97	2 36.7	17	10 32 2.93	1.184	10 54 48.2	6.84	0 48.7	
18	10 18 30.24	1.049	12 12 40.2	6.01	2 33.1	18	10 32 31.36	1.186	10 52 3.9	6.85	0 45.2	
19	10 18 55.51	1.056	12 10 15.5	6.05	2 29.6	19	10 32 59.84	1.188	10 49 19.3	6.86	0 41.8	
20	10 19 20.94	1.063	12 7 49.9	6.09	2 26.1	20	10 33 28.35	1.189	10 46 34.5	6.87	0 38.3	
21	10 19 46.54	+1.070	+12 5 23.4	-6.13	2 22.6	21	10 33 56.90	+1.190	+10 43 49.4	-6.88	0 34.9	
22	10 20 12.30	1.076	12 2 55.9	6.17	2 19.1	22	10 34 25.48	1.191	10 41 4.0	6.89	0 31.4	
23	10 20 38.20	1.082	12 0 27.5	6.20	2 15.6	23	10 34 54.03	1.192	10 38 18.5	6.90	0 28.0	
24	10 21 4.21	1.088	11 57 58.3	6.24	2 12.1	24	10 35 22.71	1.193	10 35 32.8	6.91	0 24.5	
25	10 21 30.43	1.094	11 55 28.2	6.28	2 8.6	25	10 35 51.35	1.194	10 32 46.9	6.91	0 21.1	
26	10 21 56.75	+1.100	+11 52 57.3	-6.31	2 5.1	26	10 36 20.02	+1.195	+10 30 0.9	-6.92	0 17.6	
27	10 22 23.21	1.105	11 50 25.5	6.34	2 1.6	27	10 36 48.69	1.195	10 27 14.8	6.92	0 14.2	
28	10 22 49.79	1.110	11 47 53.0	6.37	1 58.1	28	10 37 17.37	1.195	10 24 28.6	6.92	0 10.7	
29	10 23 16.59	1.115	11 45 19.7	6.40	1 54.7	29	10 37 46.05	1.195	10 21 42.4	6.92	0 7.2	
30	10 23 43.34	1.120	11 42 45.6	6.43	1 51.2	30	10 38 14.73	1.195	10 18 56.1	6.93	0 3.7	
31	10 24 10.29	+1.125	+11 40 10.9	-6.46	1 47.7	31	10 38 43.41	+1.194	+10 16 9.8	-6.93	0 0.2	
32	10 24 37.35	+1.130	+11 37 35.4	-6.49	1 44.2	32	10 39 12.08	+1.194	+10 13 21.5	-6.93	23 53.4	
Day of the Month.						Day of the Month.						
			5th.	13th.	21st.				6th.	14th.	22d.	30th.
Polar Semidiameter . .			7'.9	7'.8	7'.7	Polar Semidiameter . .			7'.6	7'.6	7'.6	7'.6
Horizontal Parallax . .			0.9	0.9	0.9	Horizontal Parallax . .			0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.						
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	10 39 12.08	+1.194	+10 13 23.5	-6.93	23 53.4	1	10 53 9.35	+1.106	+8 52 24.6	-6.40	22 9.3	
2	10 39 40.74	1.194	10 10 37.2	6.93	23 49.9	2	10 53 35.82	1.100	8 49 51.4	6.37	22 5.8	
3	10 40 9.39	1.193	10 7 51.0	6.92	23 46.5	3	10 54 2.15	1.094	8 47 19.1	6.34	22 2.3	
4	10 40 38.03	1.193	10 5 4.8	6.92	23 43.0	4	10 54 28.34	1.088	8 44 47.7	6.30	21 58.8	
5	10 41 6.64	1.192	10 2 18.8	6.91	23 39.6	5	10 54 54.40	1.082	8 42 17.2	6.26	21 55.3	
6	10 41 35.23	+1.191	+ 9 59 32.9	-6.91	23 36.1	6	10 55 20.31	+1.076	+8 39 47.5	-6.22	21 51.8	
7	10 42 3.79	1.190	9 56 47.1	6.90	23 32.7	7	10 55 46.06	1.070	8 37 18.9	6.18	21 48.3	
8	10 42 32.31	1.188	9 54 1.4	6.90	23 29.2	8	10 56 11.65	1.063	8 34 51.4	6.14	21 44.7	
9	10 43 0.79	1.186	9 51 16.0	6.89	23 25.7	9	10 56 37.09	1.056	8 32 24.7	6.10	21 41.2	
10	10 43 29.23	1.184	9 48 30.9	6.88	23 22.2	10	10 57 2.36	1.049	8 29 59.1	6.05	21 37.7	
11	10 43 57.63	+1.182	+ 9 45 46.0	-6.87	23 18.8	11	10 57 27.46	+1.042	+8 27 34.7	-6.00	21 34.2	
12	10 44 25.99	1.180	9 43 1.3	6.86	23 15.3	12	10 57 52.39	1.035	8 25 11.3	5.95	21 30.7	
13	10 44 54.28	1.178	9 40 17.0	6.85	23 11.9	13	10 58 17.14	1.028	8 22 49.0	5.90	21 27.2	
14	10 45 22.51	1.175	9 37 33.0	6.83	23 8.4	14	10 58 41.70	1.020	8 20 27.9	5.85	21 23.7	
15	10 45 50.68	1.172	9 34 49.4	6.81	23 5.0	15	10 59 6.06	1.012	8 18 8.1	5.80	21 20.2	
16	10 46 18.79	+1.169	+ 9 32 6.2	-6.79	23 1.5	16	10 59 30.26	+1.004	+8 15 49.5	-5.75	21 16.6	
17	10 46 46.81	1.166	9 29 23.4	6.77	22 58.0	17	10 59 54.26	0.996	8 13 32.1	5.70	21 13.1	
18	10 47 14.77	1.163	9 26 41.1	6.75	22 54.5	18	11 0 18.06	0.988	8 11 16.0	5.65	21 9.5	
19	10 47 42.64	1.160	9 23 59.3	6.73	22 51.1	19	11 0 41.64	0.979	8 9 1.3	5.59	21 6.0	
20	10 48 10.43	1.156	9 21 17.9	6.71	22 47.6	20	11 1 5.01	0.970	8 6 47.9	5.53	21 2.4	
21	10 48 38.13	+1.152	+ 9 18 37.1	-6.69	22 44.1	21	11 1 28.17	+0.961	+8 4 35.9	-5.47	20 58.9	
22	10 49 5.73	1.148	9 15 56.9	6.67	22 40.6	22	11 1 51.11	0.952	8 2 25.3	5.41	20 55.3	
23	10 49 33.34	1.144	9 13 17.3	6.65	22 37.2	23	11 2 13.83	0.943	8 0 16.2	5.35	20 51.8	
24	10 50 0.65	1.140	9 10 38.3	6.62	22 33.7	24	11 2 36.33	0.933	7 58 8.5	5.29	20 48.2	
25	10 50 27.95	1.136	9 7 59.9	6.59	22 30.2	25	11 2 58.60	0.923	7 56 2.3	5.23	20 44.7	
26	10 50 55.14	+1.131	+ 9 5 22.2	-6.56	22 26.7	26	11 3 20.63	+0.913	+7 53 57.6	-5.16	20 41.1	
27	10 51 22.23	1.126	9 2 45.2	6.53	22 23.2	27	11 3 42.43	0.903	7 51 54.4	5.10	20 37.5	
28	10 51 49.19	1.121	9 0 8.9	6.50	22 19.7	28	11 4 3.99	0.893	7 49 52.9	5.04	20 33.9	
29	10 52 16.03	1.116	8 57 33.3	6.47	22 16.3	29	11 4 25.31	0.883	7 47 52.9	4.97	20 30.3	
30	10 52 42.75	1.111	8 54 58.5	6.44	22 12.8	30	11 4 46.38	0.873	7 45 54.5	4.90	20 26.7	
31	10 53 9.35	+1.106	+ 8 52 24.6	-6.40	22 9.3	31	11 5 7.20	+0.862	+7 43 57.7	-4.83	20 23.1	
32	10 53 35.82	+1.100	+ 8 49 51.4	-6.37	22 5.8	32	11 5 27.76	+0.851	+7 42 2.6	-4.76	20 19.5	
Day of the Month.			7th.	15th.	23d.	Day of the Month.			1st.	9th.	17th.	25th.
Polar Semidiameter			7.6	7.6	7.6	Polar Semidiameter . .			7.7	7.7	7.8	7.9
Horizontal Parallax			0.9	0.9	0.9	Horizontal Parallax . .			0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
h m s	h m s	s	° ' "	"	h m	h m s	h m s	s	° ' "	"	h m
1	11 5 27.76	+0.851	+7 42 2.6	-4.76	20 19.5	1	11 13 25.26	+0.453	+6 59 39.9	-2.16	18 29.3
2	11 5 48.07	0.840	7 40 9.2	4.69	20 15.9	2	11 13 35.93	0.438	6 58 49.4	2.06	18 25.6
3	11 6 8.11	0.829	7 38 17.6	4.62	20 12.3	3	11 13 46.22	0.422	6 58 1.3	1.96	18 21.8
4	11 6 27.87	0.818	7 36 27.7	4.55	20 8.7	4	11 13 56.14	0.406	6 57 15.6	1.86	18 18.1
5	11 6 47.37	0.807	7 34 39.5	4.47	20 5.1	5	11 14 5.68	0.390	6 56 32.3	1.75	18 14.3
6	11 7 6.60	+0.795	+7 32 53.1	-4.40	20 1.5	6	11 14 14.64	+0.374	+6 55 51.6	-1.65	18 10.5
7	11 7 25.54	0.783	7 31 8.6	4.33	19 57.9	7	11 14 23.61	0.358	6 55 13.3	1.55	18 6.7
8	11 7 44.19	0.771	7 29 26.0	4.24	19 54.3	8	11 14 32.00	0.342	6 54 37.5	1.45	18 2.9
9	11 8 2.55	0.759	7 27 45.3	4.16	19 50.6	9	11 14 39.99	0.325	6 54 4.2	1.34	17 59.1
10	11 8 30.62	0.747	7 26 6.4	4.08	19 47.0	10	11 14 47.59	0.308	6 53 33.5	1.23	17 55.3
11	11 8 38.39	+0.734	+7 24 29.6	-4.00	19 43.4	11	11 14 54.79	+0.292	+6 53 5.4	-1.13	17 51.5
12	11 8 55.86	0.721	7 22 54.7	3.92	19 39.7	12	11 15 1.60	0.275	6 52 39.8	1.02	17 47.6
13	11 9 13.01	0.708	7 21 21.9	3.84	19 36.0	13	11 15 8.00	0.259	6 52 16.8	0.91	17 43.8
14	11 9 29.86	0.695	7 19 51.0	3.75	19 32.4	14	11 15 14.00	0.242	6 51 56.3	0.80	17 40.0
15	11 9 46.39	0.682	7 18 22.2	3.66	19 28.7	15	11 15 19.60	0.225	6 51 38.5	0.69	17 36.1
16	11 10 2.60	+0.669	+7 16 55.6	-3.57	19 25.0	16	11 15 24.79	+0.208	+6 51 23.2	-0.59	17 32.3
17	11 10 18.49	0.656	7 15 31.0	3.48	19 21.4	17	11 15 29.58	0.191	6 51 10.5	0.48	17 28.4
18	11 10 34.06	0.642	7 14 8.6	3.39	19 17.7	18	11 15 33.97	0.174	6 51 0.4	0.37	17 24.5
19	11 10 49.29	0.628	7 12 48.3	3.30	19 14.0	19	11 15 37.94	0.157	6 50 52.9	0.26	17 20.7
20	11 11 4.19	0.614	7 11 30.2	3.21	19 10.3	20	11 15 41.51	0.140	6 50 48.0	0.15	17 16.8
21	11 11 18.75	+0.600	+7 10 14.3	-3.12	19 6.6	21	11 15 44.66	+0.123	+6 50 45.7	-0.05	17 12.9
22	11 11 32.98	0.586	7 9 0.5	3.03	19 2.9	22	11 15 47.41	0.106	6 50 46.0	+0.06	17 9.0
23	11 11 46.87	0.572	7 7 49.1	2.93	18 59.2	23	11 15 49.75	0.089	6 50 48.9	0.17	17 5.1
24	11 12 0.41	0.557	7 6 39.9	2.84	18 55.5	24	11 15 51.69	0.072	6 50 54.5	0.28	17 1.2
25	11 12 13.60	0.542	7 5 32.9	2.74	18 51.8	25	11 15 53.21	0.055	6 51 2.5	0.39	16 57.3
26	11 12 26.44	+0.528	+7 4 28.2	-2.65	18 48.1	26	11 15 54.33	+0.038	+6 51 13.1	+0.50	16 53.4
27	11 12 38.91	0.513	7 3 25.9	2.56	18 44.3	27	11 15 55.03	0.021	6 51 26.3	0.60	16 49.5
28	11 12 51.04	0.498	7 2 25.9	2.46	18 40.6	28	11 15 55.33	+0.004	6 51 42.1	0.71	16 45.5
29	11 13 2.81	0.483	7 1 28.2	2.36	18 36.9	29	11 15 55.20	-0.013	6 52 0.5	0.82	16 41.6
30	11 13 14.22	0.468	7 0 32.8	2.26	18 33.1	30	11 15 54.68	0.030	6 52 21.4	0.92	16 37.7
31	11 13 25.26	+0.453	+6 59 39.9	-2.16	18 29.3	31	11 15 53.74	-0.047	+6 52 44.8	+1.03	16 33.7
32	11 13 35.93	+0.438	+6 58 49.4	-2.06	18 25.6	32	11 15 52.40	-0.065	+6 53 10.8	+1.14	16 29.7
Day of the Month.						Day of the Month.					
2d. 10th. 18th. 26th.						4th. 12th. 20th. 28th. 30th.					
Polar Semidiameter . . 7.9 8.0 8.1 8.2						Polar Semidiameter . . 8.4 8.5 8.6 8.7 8.8					
Horizontal Parallax . . 0.9 0.9 0.9 0.9						Horizontal Parallax . . 0.9 1.0 1.0 1.0 1.0					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.											
Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
Jan. 2	13 38 34.36	+5.911	-9 37 30.0	-32.31	18 47.3	July 1	13 24 26.92	+0.117	-8 15 22.0	-3.17	6 45.4
6	13 38 56.43	5.120	9 39 30.0	27.71	18 31.9	5	13 24 26.96	0.902	8 15 44.0	7.84	6 29.7
10	13 39 15.30	4.310	9 41 11.5	23.01	18 16.5	9	13 24 34.14	1.690	8 16 24.7	12.51	6 14.1
14	13 39 30.89	3.482	9 42 34.1	18.94	18 1.0	13	13 24 42.48	2.480	8 17 24.1	17.17	5 58.5
18	13 39 43.14	2.638	9 43 37.4	13.39	17 45.4	17	13 24 53.97	3.264	8 18 42.1	21.81	5 42.9
22	13 39 51.99	+1.785	-9 44 21.2	-8.50	17 29.9	21	13 25 8.58	+4.039	-8 20 18.5	-26.38	5 27.4
26	13 39 57.42	0.930	9 44 45.4	-3.61	17 14.2	25	13 25 26.27	4.800	8 22 12.9	30.83	5 12.0
30	13 39 59.43	+0.080	9 44 50.1	+1.23	16 58.5	29	13 25 46.96	5.540	8 24 25.0	35.16	4 56.6
Feb. 3	13 39 58.07	-0.760	9 44 35.6	6.00	16 42.7	Aug. 2	13 26 10.58	6.365	8 26 54.0	39.36	4 41.3
7	13 39 53.37	1.589	9 44 2.2	10.70	16 26.9	6	13 26 37.05	6.970	8 29 39.6	43.42	4 26.0
11	13 39 45.37	-2.407	-9 43 10.1	+15.33	16 11.1	10	13 27 6.31	+7.656	-8 32 41.2	-47.36	4 10.8
15	13 39 34.14	3.207	9 41 59.6	19.85	15 55.1	14	13 27 38.28	8.321	8 35 58.3	51.16	3 55.6
19	13 39 19.75	3.981	9 40 31.5	24.23	15 39.2	18	13 28 12.85	8.958	8 39 30.2	54.77	3 40.4
23	13 39 2.33	4.794	9 38 46.1	28.41	15 23.2	22	13 28 49.90	9.564	8 43 16.2	58.18	3 25.3
27	13 38 42.02	5.425	9 36 44.5	32.37	15 7.1	26	13 29 29.31	10.137	8 47 15.4	61.37	3 10.2
Mar. 3	13 38 18.99	-6.064	-9 34 27.5	+36.08	14 51.0	30	13 30 10.95	10.677	-8 51 26.9	-64.35	2 55.2
7	13 37 53.40	6.699	9 31 56.2	39.54	14 34.8	Sept. 3	13 30 54.69	11.187	8 55 49.9	67.12	2 40.2
11	13 37 25.45	7.269	9 29 11.5	42.73	14 18.6	7	13 31 40.40	11.666	9 0 23.6	69.69	2 25.2
15	13 36 55.32	7.789	9 26 14.7	45.66	14 2.4	11	13 32 27.97	12.110	9 5 7.2	72.06	2 10.3
19	13 36 23.21	8.254	9 23 6.7	48.26	13 46.1	15	13 33 17.23	12.617	9 9 59.8	74.19	1 55.4
23	13 35 49.37	-8.658	-9 19 49.1	+50.51	13 29.8	19	13 34 8.04	12.881	-9 15 0.3	-76.04	1 40.5
27	13 35 14.05	8.992	9 16 23.2	52.38	13 13.5	23	13 35 0.23	13.204	9 20 7.8	77.64	1 25.6
31	13 34 37.51	9.263	9 12 50.5	53.86	12 57.2	27	13 35 53.61	13.485	9 25 21.1	78.97	1 10.8
Apr. 4	13 34 0.03	9.468	9 9 12.8	54.97	12 40.8	Oct. 1	13 36 48.06	13.729	9 30 39.2	80.07	0 56.0
8	13 33 21.86	9.610	9 5 31.3	55.79	12 24.5	5	13 37 43.39	13.932	9 36 1.4	80.95	0 41.2
12	13 32 43.24	-9.688	-9 1 47.5	+56.09	12 8.1	9	13 38 39.46	14.095	-9 41 26.5	-81.55	0 26.4
16	13 32 4.44	9.698	8 58 3.0	56.08	11 51.7	13	13 39 36.09	14.212	9 46 53.6	81.94	0 11.6
20	13 31 25.75	9.637	8 54 19.4	55.65	11 35.3	17	13 40 33.09	14.281	9 52 21.7	82.02	23 53.1
24	13 30 47.44	9.506	8 50 38.4	54.81	11 19.0	21	13 41 30.27	14.302	9 57 49.4	81.81	23 38.3
28	13 30 9.79	9.308	8 47 1.5	53.57	11 2.6	25	13 42 27.45	14.279	10 3 15.8	81.35	23 23.5
May 2	13 29 33.06	-9.051	-8 43 30.3	+51.98	10 46.3	29	13 43 24.44	14.211	-10 8 39.9	-80.64	23 8.7
6	13 28 57.46	8.736	8 40 6.1	50.05	10 30.0	Nov. 2	13 44 21.08	14.101	10 14 0.6	79.70	22 54.0
10	13 28 23.24	8.366	8 36 50.3	47.80	10 13.7	6	13 45 17.19	13.946	10 19 17.1	79.51	22 39.2
14	13 27 50.61	7.940	8 33 44.1	45.22	10 57.4	10	13 46 12.59	13.742	10 24 28.4	77.05	22 24.4
18	13 27 19.79	7.459	8 30 48.9	42.32	9 41.2	14	13 47 7.06	13.489	10 29 33.2	75.32	22 9.5
22	13 26 51.00	-6.927	-8 28 6.0	+39.10	9 25.0	18	13 48 0.43	13.166	-10 34 30.6	-73.32	21 54.7
26	13 26 24.43	6.350	8 25 36.5	35.61	9 8.8	22	13 48 52.48	12.836	10 39 19.5	71.09	21 39.8
30	13 26 0.25	5.735	8 23 21.4	31.90	8 52.7	26	13 49 43.07	12.449	10 43 59.1	68.65	21 24.9
June 3	13 25 38.50	5.088	8 21 21.5	28.01	8 36.6	30	13 50 32.02	12.018	10 48 28.5	66.00	21 10.0
7	13 25 19.58	4.419	8 19 37.6	23.94	8 20.6	Dec. 4	13 51 19.16	11.544	10 52 46.8	63.13	20 55.0
11	13 25 3.34	-3.706	-8 18 10.2	+19.71	8 4.6	8	13 52 4.32	11.025	-10 56 53.2	-60.03	20 40.1
15	13 24 49.97	2.973	8 17 0.1	15.31	7 48.7	12	13 52 47.31	10.469	11 0 46.8	56.71	20 25.0
19	13 24 39.58	2.218	8 16 7.9	10.78	7 32.8	16	13 53 27.96	9.857	11 4 26.6	53.18	20 10.0
23	13 24 32.25	1.447	8 15 34.0	6.16	7 16.9	20	13 54 6.12	9.215	11 7 52.0	49.47	19 54.9
27	13 24 28.02	-0.667	8 15 18.6	+1.50	7 1.1	24	13 54 41.63	8.541	11 11 2.2	45.61	19 39.7
July 1	13 24 26.92	+0.117	-8 15 22.0	-3.17	6 45.4	28	13 55 14.40	+7.639	-11 13 56.7	-41.68	19 24.5
5	13 24 28.96	+0.902	-8 15 44.0	-7.84	6 29.7	32	13 55 44.29	+7.102	-11 16 35.0	-37.50	19 9.3

Greatest horizontal parallax,
Least horizontal parallax,

April 14, 0".51.
October 19, 0".45.

Greatest semidiameter,
Least semidiameter,

April 14, 1".92.
October 19, 1".72.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.	
	Noon.				Noon.						Noon.				Noon.					
	h	m	s	"	°	'	"	"	h	m	h	m	s	"	°	'	"	"	h	m
Jan. 2	4	1	45.51	-5.067	+18 57	27.6	-11.74	9 11.9		July 1	4	15	49.05	+8.103	+19 41	15.9	+18.85	21 34.4		
6	4	1	26.07	4.653	18 56	43.3	10.41	8 55.9		5	4	16	20.90	7.816	19 42	29.3	17.86	21 19.2		
10	4	1	8.32	4.915	18 56	4.4	9.03	8 39.9		9	4	16	51.54	7.502	19 43	38.7	16.89	21 4.0		
14	4	0	52.39	3.744	18 55	31.2	7.55	8 23.9		13	4	17	20.88	7.169	19 44	43.8	15.73	20 48.7		
18	4	0	38.40	3.248	18 55	4.1	5.99	8 7.9		17	4	17	48.80	6.792	19 45	44.5	14.60	20 33.5		
22	4	0	26.43	-2.732	+18 54	43.3	-4.41	7 52.0		21	4	18	15.18	+6.396	+19 46	40.5	+13.40	20 18.2		
26	4	0	16.57	2.196	18 54	28.9	2.77	7 36.1		25	4	18	39.94	5.978	19 47	31.7	12.19	20 2.8		
30	4	0	8.88	1.647	18 54	21.2	-1.10	7 20.2		29	4	19	2.98	5.540	19 48	18.0	10.95	19 47.5		
Feb. 3	4	0	3.41	1.068	18 54	20.1	+0.57	7 4.4		Aug. 2	4	19	24.24	5.066	19 48	59.3	9.71	19 32.1		
7	4	0	0.19	-0.529	18 54	25.7	9.25	6 48.6		6	4	19	43.64	4.612	19 49	35.6	8.42	19 16.7		
11	3	59	59.24	+0.048	+18 54	38.0	+3.93	6 32.9		10	4	20	1.11	+4.118	+19 50	6.6	+7.11	19 1.3		
15	4	0	0.58	0.625	18 54	57.1	5.60	6 17.2		14	4	20	16.56	3.606	19 50	32.4	5.78	18 45.8		
19	4	0	4.24	1.902	18 55	22.8	7.94	6 1.6		18	4	20	29.94	3.078	19 50	52.8	4.41	18 30.3		
23	4	0	10.19	1.773	18 55	55.0	8.87	5 45.9		22	4	20	41.17	2.540	19 51	7.7	3.06	18 14.7		
27	4	0	18.42	2.340	18 56	33.7	10.46	5 30.3		26	4	20	50.25	1.985	19 51	17.3	1.72	17 59.1		
Mar. 3	4	0	28.89	+2.891	+18 57	18.6	+11.97	5 14.8		30	4	20	57.14	+1.445	+19 51	21.5	+0.39	17 43.5		
7	4	0	41.53	3.429	18 58	9.4	13.44	4 59.3		Sept. 3	4	21	1.80	0.888	19 51	20.4	-0.95	17 27.9		
11	4	0	56.31	3.959	18 59	6.0	14.84	4 43.8		7	4	21	4.24	+0.331	19 51	13.9	2.28	17 12.2		
15	4	1	13.18	4.473	19 0	8.0	16.16	4 28.3		11	4	21	4.44	-0.929	19 51	2.2	3.50	16 56.5		
19	4	1	32.06	4.970	19 1	15.2	17.44	4 12.9		15	4	21	2.39	0.791	19 50	45.2	4.90	16 40.7		
23	4	1	52.90	+5.447	+19 2	27.4	+18.64	3 57.6		19	4	20	58.12	-1.344	+19 50	23.1	-6.14	16 24.9		
27	4	2	15.60	5.899	19 3	41.2	19.74	3 42.2		23	4	20	51.65	1.889	19 49	56.1	7.37	16 9.0		
31	4	2	40.06	6.397	19 5	5.2	20.74	3 26.9		27	4	20	43.03	2.417	19 49	24.2	8.57	15 53.2		
Apr. 4	4	3	6.18	6.730	19 6	30.0	21.65	3 11.6		Oct. 1	4	20	32.33	2.931	19 48	47.6	9.69	15 37.3		
8	4	3	33.87	7.109	19 7	58.3	22.48	2 56.3		5	4	20	19.60	3.432	19 48	6.7	10.78	15 21.3		
12	4	4	3.02	+7.463	+19 9	29.7	+23.20	2 41.1		9	4	20	4.90	-3.913	+19 47	21.4	-11.84	15 5.3		
16	4	4	33.54	7.790	19 11	3.8	23.85	2 25.9		13	4	19	48.33	4.368	19 46	32.1	12.81	14 49.3		
20	4	5	5.30	8.088	19 12	40.4	24.40	2 10.7		17	4	19	29.98	4.800	19 45	39.0	13.71	14 33.3		
24	4	5	38.20	8.356	19 14	18.9	24.83	1 55.5		21	4	19	9.97	5.199	19 44	42.5	14.53	14 17.2		
28	4	6	12.10	8.589	19 15	58.9	25.16	1 40.3		25	4	18	48.43	5.566	19 43	42.8	15.36	14 1.1		
May 2	4	6	46.87	+8.792	+19 17	40.1	+25.40	1 25.2		29	4	18	25.49	-5.897	+19 42	40.5	-15.91	13 45.0		
6	4	7	22.40	8.968	19 19	22.0	25.55	1 10.0		Nov. 2	4	18	1.30	6.192	19 41	35.7	16.48	13 28.9		
10	4	7	58.57	9.111	19 21	4.4	25.63	0 54.9		6	4	17	36.00	6.454	19 40	28.8	16.95	13 12.8		
14	4	8	35.25	9.225	19 22	46.9	25.59	0 39.8		10	4	17	9.72	6.675	19 39	20.2	17.33	12 56.6		
18	4	9	12.33	9.307	19 24	29.0	25.47	0 24.7		14	4	16	42.66	6.849	19 38	10.3	17.60	12 40.4		
22	4	9	49.66	+9.353	+19 26	10.5	+25.25	0 9.5		18	4	16	14.09	-6.978	+19 36	59.6	-17.72	12 24.2		
26	4	10	27.11	9.367	19 27	50.9	24.94	23 50.7		22	4	15	46.90	7.058	19 35	48.7	17.73	12 8.0		
30	4	11	4.55	9.349	19 29	29.9	24.55	23 35.6		26	4	15	18.58	7.097	19 34	37.9	17.64	11 51.8		
June 3	4	11	41.86	9.301	19 31	7.2	24.07	23 20.5		30	4	14	50.18	7.091	19 33	27.7	17.46	11 35.6		
7	4	12	18.92	9.294	19 32	42.4	23.53	23 5.3		Dec. 4	4	14	21.91	7.039	19 32	18.4	17.15	11 19.4		
11	4	12	55.61	+9.115	+19 34	15.4	+22.94	22 50.2		8	4	13	53.93	-6.941	+19 31	10.7	-16.71	11 3.2		
15	4	13	31.80	8.975	19 35	45.8	22.95	22 35.1		12	4	13	26.44	6.798	19 30	5.0	16.15	10 47.1		
19	4	14	7.37	8.803	19 37	13.3	21.50	22 19.9		16	4	12	59.61	6.606	19 29	1.7	15.47	10 30.9		
23	4	14	42.18	8.597	19 38	37.7	20.67	22 4.8		20	4	12	33.65	6.369	19 28	1.4	14.69	10 14.8		
27	4	15	16.11	8.363	19 39	58.6	19.78	21 49.6		24	4	12	8.71	6.099	19 27	4.4	13.79	9 58.6		
July 1	4	15	49.05	+8.103	+19 41	15.9	+18.85	21 34.4		28	4	11	44.96	-5.778	+19 26	11.2	-12.80	9 42.5		
5	4	16	20.90	+7.816	+19 42	29.3	+17.86	21 19.2		32	4	11	22.53	-5.489	+19 25	22.1	-11.74	9 26.4		

Greatest horizontal parallax,
Least horizontal parallax,

November 24, 0".31.
May 23, 0".29.

Greatest semidiameter,
Least semidiameter,

November 24, 1".33.
May 23, 1".25.

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
Jan. 0	329 26 7.2	3 54 9.6	- 5 23.1	-6 50 27.4	+ 6 5.5	9.5950178	0.1050465	0.0994123	
2	337 27 46.3	4 7 51.4	8 23.9	6 33 58.1	10 22.6	9.5823237	0.0933973	0.0869810	
4	345 58 31.8	4 23 8.3	10 53.0	6 8 6.0	15 28.1	9.5689666	0.0801424	0.0728590	
6	355 1 13.4	4 39 45.8	12 28.5	5 31 44.9	20 57.6	9.5551929	0.0651108	0.0568765	
8	4 38 17.7	4 57 26.8	12 49.3	4 44 1.4	26 48.3	9.5413453	0.0481363	0.0388742	
10	14 51 22.4	5 15 40.0	-11 37.2	-3 44 30.4	+32 41.2	9.5278779	0.0290764	0.0187359	
12	25 40 48.2	5 33 38.4	8 45.0	2 33 35.7	38 5.9	9.5153573	0.0078524	9.9964346	
14	37 5 3.9	5 50 18.3	- 4 22.9	-1 12 52.7	42 22.0	9.5044419	9.9845044	9.9720987	
16	49 0 15.8	6 4 20.3	+ 0 53.5	+0 14 35.6	44 43.5	9.4958264	9.9592721	9.9461008	
18	61 19 41.3	6 14 21.3	6 11.1	1 44 18.1	44 30.8	9.4901491	9.9326850	9.9191506	
20	73 54 1.3	6 19 6.1	+10 24.3	+3 10 42.4	+41 24.3	9.4878779	9.9056508	9.8923617	
22	86 31 59.5	6 17 53.2	12 38.7	4 28 6.9	35 35.8	9.4892118	9.8794887	9.8672489	
24	99 1 36.5	6 10 47.0	12 28.5	5 31 45.0	27 46.8	9.4940332	9.8558701	9.8455781	
26	111 11 41.4	5 58 32.6	10 4.5	6 18 33.7	18 57.4	9.5019362	9.8365825	9.8290647	
28	122 53 13.3	5 42 26.8	6 4.7	6 47 34.7	10 8.0	9.5123161	9.8231637	9.8189669	
30	134 0 2.6	5 24 5.1	+ 1 20.9	+6 59 36.4	+ 2 4.2	9.5244827	9.8165049	9.8157516	
Feb. 1	144 28 58.0	5 4 47.8	- 3 18.0	6 56 39.8	- 4 47.2	9.5377611	9.8166254	9.8190076	
3	154 19 23.0	4 45 43.8	7 17.1	6 41 21.3	10 17.6	9.5515575	9.8227441	9.8276631	
5	163 32 33.5	4 27 39.4	10 15.8	6 16 21.1	14 30.3	9.5653877	9.8335856	9.8403359	
7	172 10 59.0	4 11 2.1	12 6.2	5 44 5.6	17 34.8	9.5788812	9.8477469	9.8556663	
9	180 17 49.0	3 56 5.0	-12 50.6	+5 6 39.3	-19 43.3	9.5917677	9.8639586	9.8725068	
11	187 56 28.1	3 42 51.2	12 36.3	4 25 42.2	21 7.4	9.6038595	9.8812109	9.8899877	
13	195 10 21.1	3 31 18.0	11 33.5	3 42 32.7	21 57.3	9.6150319	9.8987686	9.9074988	
15	202 2 43.3	3 21 19.5	9 52.7	2 58 10.3	22 21.4	9.6252066	9.9161344	9.9246409	
17	208 36 37.2	3 12 48.2	7 44.5	2 13 19.9	22 26.2	9.6343380	9.9321924	9.9411694	
19	214 54 49.5	3 5 37.0	- 5 17.9	+1 28 34.9	-22 16.8	9.6424036	9.9491581	9.9569484	
21	220 59 53.9	2 59 38.9	2 41.9	0 44 20.2	21 56.6	9.6493948	9.9645348	9.9719138	
23	226 54 9.6	2 54 47.3	- 0 3.3	+0 0 54.2	21 28.2	9.6553124	9.9790849	9.9860485	
25	232 39 44.1	2 50 57.2	+ 2 31.5	-0 41 28.6	20 53.7	9.6601621	9.9928070	9.9993641	
27	238 18 36.4	2 48 4.2	4 57.4	1 22 37.2	20 14.0	9.6639512	0.0057234	0.0118982	
Mar. 1	243 52 36.5	2 46 4.6	+ 7 9.8	-2 2 21.9	-19 30.0	9.6686877	0.0178644	0.0236569	
3	249 23 29.2	2 44 56.5	9 4.9	2 40 34.4	18 41.8	9.6683781	0.0292703	0.0347099	
5	254 52 55.6	2 44 37.9	10 39.4	3 17 6.1	17 49.2	9.6690266	0.0390804	0.0450860	
7	260 22 33.6	2 45 8.2	11 50.3	3 51 48.3	16 52.1	9.6686350	0.0500317	0.0548216	
9	265 54 1.4	2 46 27.6	12 35.2	4 24 30.8	15 49.5	9.6672018	0.0594594	0.0639486	
11	271 28 57.4	2 48 36.9	+12 52.1	-4 55 2.0	-14 40.5	9.6647241	0.0682927	0.0724946	
13	277 9 3.4	2 51 37.8	12 39.3	5 23 7.7	13 23.8	9.6611952	0.0765563	0.0804796	
15	282 56 4.7	2 55 32.8	11 55.9	5 48 31.1	11 57.8	9.6566080	0.0842663	0.0879179	
17	288 51 53.3	3 0 25.6	10 41.3	6 10 51.3	10 20.3	9.6509542	0.0914346	0.0948166	
19	294 58 28.1	3 6 19.7	8 55.9	6 29 43.1	8 22.0	9.6442278	0.0980631	0.1011729	
21	301 17 56.5	3 13 20.2	+ 6 41.6	-6 44 36.1	- 6 20.9	9.6364266	0.1041441	0.1069753	
23	307 52 37.0	3 21 32.3	4 1.6	6 54 53.4	3 52.8	9.6275560	0.1096621	0.1122006	
25	314 44 58.6	3 31 2.3	+ 1 1.0	6 59 51.3	- 1 0.9	9.6176349	0.1145861	0.1168124	
27	321 57 41.6	3 41 54.9	- 2 12.0	6 58 38.5	+ 2 18.6	9.6067022	0.1188728	0.1207596	
29	329 33 36.7	3 54 15.0	5 26.1	6 50 15.9	6 2.4	9.5948270	0.1224634	0.1239734	
31	337 35 41.6	4 8 5.2	- 8 26.4	-6 33 38.4	+10 34.0	9.5821210	0.1252777	0.1263635	
33	346 6 56.3	4 23 23.4	-10 55.2	-6 7 36.9	+15 33.1	9.5687552	0.1272164	0.1276202	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Apr. 2	346	6	56.3	4 23 23.4	-10 55.2	-6	7	36.9	+15 33.1	9.5687552	0.1272164	0.1278202
4	355	10	9.0	4 40 2.0	12 29.5	5	31	5.5	21 3.0	9.5549772	0.1281570	0.1282077
6	4	47	46.6	4 57 43.8	12 49.0	4	43	11.0	26 53.8	9.5411317	0.1279524	0.1273691
8	15	1	25.6	5 15 57.1	11 35.4	3	43	28.9	32 46.4	9.5276743	0.1264355	0.1251281
10	25	51	25.2	5 33 55.2	8 41.6	2	32	24.1	38 10.5	9.5151734	0.1234237	0.1212987
12	37	16	13.0	5 50 33.0	-4 18.9	-1	11	33.1	+42 25.9	9.5042884	0.1187312	0.1156999
14	49	11	50.5	6 4 31.0	+0 58.6	+0	15	59.6	44 44.5	9.4957137	0.1121870	0.1081770
16	61	31	34.7	6 14 26.0	6 15.6	1	45	41.7	44 29.5	9.4900861	0.1036578	0.0986229
18	74	6	3.8	6 19 5.8	10 27.4	3	11	59.9	41 30.1	9.4878700	0.0930698	0.0870018
20	86	43	59.6	6 17 49.0	12 39.6	4	29	13.7	35 28.8	9.4892598	0.0804262	0.0733569
22	99	13	22.8	6 10 37.6	+12 27.2	+5	32	36.8	+27 36.8	9.4941330	0.0658114	0.0578115
24	111	23	4.8	5 59 19.1	10 1.4	6	19	9.2	18 49.1	9.5020797	0.0493820	0.0405508
26	123	4	6.5	5 42 12.0	6 0.4	6	47	53.6	9 59.9	9.5124928	0.0313476	0.0218029
28	134	10	21.0	5 23 47.2	+1 16.5	6	59	40.0	+1 57.1	9.5246821	0.0119483	0.0018156
30	144	38	40.3	5 4 29.6	-3 22.2	6	56	30.7	-4 53.1	9.5379733	9.9914358	9.9808403
May 2	154	28	29.2	4 45 26.3	-7 20.4	+6	41	1.9	-10 22.2	9.5517738	9.9700607	9.9591270
4	163	41	5.8	4 27 23.1	10 18.0	6	15	53.8	14 33.6	9.5656015	9.9480696	9.9369188
6	172	19	0.0	4 10 47.2	12 7.4	5	43	32.6	17 37.2	9.5790876	9.9257052	9.9144601
8	180	25	21.7	3 55 51.8	12 50.8	5	6	2.3	19 44.8	9.5919633	9.9032148	9.8920021
10	188	3	36.1	3 42 39.6	12 35.7	4	25	2.6	21 8.4	9.6040417	9.8808560	9.8698130
12	195	17	7.3	3 31 8.0	-11 32.2	+3	41	51.5	-21 57.8	9.6151990	9.8589102	9.8481674
14	202	9	10.7	3 21 10.7	9 50.8	2	57	28.4	22 21.6	9.6253575	9.8376864	9.8274514
16	208	42	48.4	3 12 40.9	7 24.1	2	12	37.8	22 26.2	9.6344726	9.8175296	9.8079701
18	215	0	47.5	3 5 30.9	5 15.5	1	27	53.2	22 16.5	9.6425213	9.7988237	9.7901428
20	221	5	40.6	2 59 33.9	2 39.4	0	43	39.0	21 56.2	9.6494956	9.7819806	9.7743914
22	226	59	47.5	2 54 43.4	-0 0.9	+0	0	13.9	-21 27.7	9.6553963	9.7674294	9.7611461
24	232	45	15.0	2 50 54.0	+2 33.9	-0	42	7.8	20 53.1	9.6602290	9.7555904	9.7506075
26	238	24	1.8	2 48 1.9	4 59.6	1	23	15.1	20 13.4	9.6640012	9.7468376	9.7437136
28	243	57	58.3	2 46 3.4	7 11.8	2	2	58.5	19 29.3	9.6667212	9.7414613	9.7400928
30	249	28	49.2	2 44 55.8	9 6.5	2	41	9.4	18 41.0	9.6683950	9.7396350	9.7400687
June 1	254	58	14.8	2 44 38.1	+10 40.7	-3	17	39.5	-17 48.4	9.6690269	9.7413901	9.7435802
3	260	27	54.2	2 45 9.3	11 51.1	3	52	19.9	16 51.3	9.6686189	9.7466123	9.7504516
5	265	59	24.6	2 46 29.2	12 35.5	4	25	0.5	15 48.5	9.6671694	9.7550579	9.7603855
7	271	34	24.5	2 48 39.3	12 52.2	4	55	29.5	14 39.4	9.6646752	9.7663860	9.7730077
9	277	14	36.3	2 51 41.2	12 38.9	5	23	32.9	13 22.6	9.6611299	9.7801982	9.7879045
11	283	1	45.2	2 55 36.9	+11 54.9	-5	48	53.5	-11 56.4	9.6565262	9.7960752	9.8046596
13	288	57	42.6	3 0 30.5	10 40.0	6	11	10.7	10 18.7	9.6508559	9.8136095	9.8228786
15	295	4	28.5	3 6 25.8	8 54.1	6	29	59.0	8 27.1	9.6441132	9.8324235	9.8422038
17	301	24	10.3	3 13 27.4	6 39.3	6	44	48.0	6 18.8	9.6362956	9.8521815	9.8623215
19	307	59	6.0	3 21 40.8	3 58.9	6	55	0.7	3 50.3	9.6274089	9.8725910	9.8829600
21	314	51	45.3	3 31 19.0	+0 58.1	-6	59	53.2	-0 58.0	9.6174722	9.8934005	9.9038861
23	322	4	48.7	3 42 5.8	-2 15.0	6	58	34.1	+2 22.0	9.6065246	9.9143918	9.9248940
25	329	41	6.9	3 54 27.1	5 29.1	6	50	4.3	6 13.2	9.5946361	9.9353706	9.9157993
27	337	43	37.4	4 8 18.6	8 29.1	6	33	18.5	10 38.4	9.5819190	9.9561589	9.9664286
29	346	15	20.3	4 23 38.3	10 56.9	6	7	7.7	15 38.0	9.5685453	9.9765863	9.9866103
31	355	19	4.3	4 40 18.1	-12 30.4	-5	30	26.0	+21 8.6	9.5547642	9.9964785	0.0061673
33	4	57	14.8	4 58 0.6	-12 48.6	-4	42	20.4	+26 59.4	9.5409216	0.0156528	0.0249103

MERCURY.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
July 1	355 19 4.3	4 40 18.1	-12 30.4	-5 30 26.0	+21 8.0	9.5547642	9.9964785	0.0061673
3	4 57 14.8	4 58 0.6	12 48.6	4 42 20.4	26 59.4	9.5409216	0.0156528	0.0249103
5	15 11 27.6	5 16 14.0	11 33.4	3 42 27.5	33 52.1	9.5274750	0.0339139	0.0426367
7	26 2 0.2	5 34 11.3	8 38.0	2 31 12.6	38 15.1	9.5149943	0.0510515	0.0591305
9	37 27 18.6	5 50 47.2	- 4 14.3	-1 10 13.8	42 26.3	9.5041400	0.0668464	0 0741723
11	49 23 21.7	6 4 42.2	+ 1 3.6	+0 17 23.2	+44 45.6	9.4956066	0.0810826	0.0875543
13	61 43 23.6	6 14 32.6	6 20.2	1 47 4.7	44 27.5	9.4900926	0.0935665	0.0991031
15	74 18 0.6	6 19 7.1	10 30.4	3 13 17.1	41 15.8	9.4878675	0.1041483	0.1086968
17	86 55 53.4	6 17 44.7	12 40.6	4 30 19.7	35 22.1	9.4893127	0.1127440	0.1162917
19	99 25 2.7	6 10 26.2	12 25.9	5 33 28.1	27 30.8	9.4942367	0.1193458	0.1219172
21	111 34 21.4	5 58 5.4	+ 9 58.2	+6 19 44.1	+18 40.8	9.5022259	0.1240199	0.1256717
23	123 14 52.7	5 41 55.6	5 56.2	6 48 12.1	9 52.0	9.5126716	0.1268927	0.1277043
25	134 20 32.9	5 23 22.4	+ 1 12.0	6 59 43.6	+ 1 50.2	9.5248822	0.1281291	0.1281902
27	144 48 16.0	5 4 12.0	- 3 26.2	6 56 21.6	- 4 58.8	9.5381850	0.1279105	0.1273120
29	154 37 29.6	4 45 9.0	7 23.7	6 40 42.6	10 26.7	9.5519886	0.1264160	0.1252420
31	163 49 32.7	4 27 6.7	-10 20.3	+6 15 26.7	-14 37.0	9.5658133	0.1238109	0.1221377
Aug. 2	172 26 56.2	4 10 32.6	12 8.5	5 42 59.9	17 39.5	9.5792912	0.1202388	0.1181292
4	180 32 50.2	3 55 38.7	12 51.0	5 5 25.7	19 46.5	9.5921552	0.1152214	0.1133267
6	188 10 40.1	3 42 26.2	12 35.1	4 24 23.3	21 9.5	9.6042199	0.1106558	0.1078171
8	195 23 50.1	3 30 58.0	11 30.9	3 41 10.3	21 58.4	9.6153620	0.1048184	0.1016664
10	202 15 35.2	3 21 2.3	- 9 49.0	+2 56 46.8	-22 21.8	9.6255043	0.0983669	0.0949242
12	208 48 57.4	3 12 32.8	7 40.0	2 11 56.1	22 26.2	9.6346021	0.0913420	0.0876220
14	215 6 43.5	3 5 25.0	5 13.1	1 27 11.6	22 16.3	9.6426343	0.0837690	0.0797825
16	221 11 25.9	2 59 29.0	- 2 36.9	+0 42 58.1	21 55.8	9.6495918	0.0756643	0.0714141
18	227 5 23.8	2 54 30.4	+ 0 1.6	-0 0 26.1	21 27.2	9.6554756	0.0670318	0.0625165
20	232 50 44.4	2 50 50.4	+ 2 36.3	-0 42 46.8	-20 52.5	9.6602918	0.0578672	0.0530822
22	238 29 26.2	2 47 59.6	5 1.7	1 23 52.9	20 12.8	9.6640479	0.0481599	0.0430976
24	244 3 19.4	2 46 2.0	7 13.5	2 3 35.0	19 28.6	9.6667515	0.0378927	0.0325426
26	249 34 8.3	2 44 55.3	9 8.1	2 41 44.4	18 40.2	9.6684093	0.0270446	0.0213940
28	255 3 33.7	2 44 38.2	10 42.0	3 18 13.0	17 47.6	9.6690255	0.0155908	0.0096289
30	260 33 13.9	2 45 10.2	+11 52.1	-3 52 51.5	-16 50.2	9.6686016	0.0035062	9.9972193
Sept. 1	266 4 47.0	2 46 31.0	12 36.1	4 25 30.2	15 47.4	9.6671361	9.9907660	9.9841439
3	271 39 51.2	2 48 41.8	12 52.2	4 55 57.0	14 38.2	9.6646260	9.9773512	9.9703871
5	277 20 8.6	2 51 44.4	12 38.4	5 23 58.0	13 21.3	9.6610650	9.9632518	9.9559460
7	283 7 24.8	2 55 41.2	11 54.1	5 49 15.9	11 54.9	9.6564452	9.9484757	9.9408429
9	289 3 32.1	3 0 35.8	+10 38.5	-6 11 30.0	-10 17.1	9.6507590	9.9330575	9.9251311
11	295 10 29.0	3 6 31.8	8 52.1	6 30 14.9	8 25.3	9.6440003	9.9170781	9.9089194
13	301 30 23.6	3 13 24.4	6 37.0	6 44 59.8	6 16.6	9.6361669	9.9006405	9.8923946
15	308 5 34.7	3 21 49.2	3 56.2	6 55 7.8	3 47.8	9.6272646	9.8841024	9.8758544
17	314 58 31.7	3 31 21.4	+ 0 55.1	6 59 55.0	- 0 55.0	9.6173127	9.8677118	9.8597470
19	322 11 55.3	3 42 16.4	- 2 18.1	-6 58 29.6	+ 2 25.4	9.6063511	9.8520457	9.8447079
21	329 48 36.0	3 54 39.2	5 32.0	6 49 52.7	6 17.1	9.5944495	9.8378474	9.8315911
23	337 51 32.1	4 8 31.9	8 31.8	6 32 58.5	10 42.8	9.5817217	9.8260782	9.8214553
25	346 23 42.5	4 23 52.7	10 58.6	6 6 38.5	15 42.8	9.5683406	9.8178734	9.8154802
27	355 27 56.5	4 40 33.6	12 31.4	5 29 46.6	21 13.6	9.5545564	9.8144120	9.8147857
29	5 6 38.4	4 58 16.5	-12 48.1	-4 41 30.4	+27 4.8	9.5407168	9.8166885	9.8201697
31	15 21 23.3	5 16 30.0	-11 31.4	-3 41 26.6	+22 57.0	9.5272809	9.8252372	9.8316523

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Oct.	1 15 21 23.3	5 16 30.0	-11 31.4	-3 41 26.6	+39 57.0	9.5272809	9.8252372	9.8318523
	3 26 12 27.4	5 34 36.6	8 34.4	2 30 2.0	33 19.6	9.5148205	9.8399312	9.8493500
	5 37 38 14.8	5 51 0.7	-4 9.6	-1 8 55.5	42 31.4	9.5039968	9.8599505	9.8715511
	7 49 34 41.6	6 4 52.3	+1 8.8	+0 16 45.4	44 46.5	9.4955043	9.8839560	9.8969648
	9 61 55 0.0	6 14 38.5	6 24.7	1 48 26.1	44 25.8	9.4899758	9.9103812	9.9240210
	11 74 29 43.7	6 19 7.7	+10 33.4	+3 14 32.4	+41 11.4	9.4878689	9.9377137	9.9513123
	13 87 7 32.2	6 17 40.0	12 41.5	4 31 24.1	35 16.1	9.4893684	9.9646894	9.9777398
	15 99 36 27.0	6 10 18.4	12 24.6	5 34 18.1	27 23.0	9.4943422	9.9903796	0.0025453
	17 111 45 21.9	5 57 51.6	9 55.1	6 20 17.9	18 32.6	9.5023731	0.0141914	0.0252886
	19 123 25 22.9	5 41 39.2	5 52.1	6 48 29.9	9 44.3	9.5128501	0.0358208	0.0457824
	21 134 30 28.9	5 23 11.8	+1 7.7	+6 59 46.8	+1 43.4	9.5250814	0.0551766	0.0640140
	23 144 57 36.8	5 3 53.8	-3 30.2	6 56 12.5	-5 4.4	9.5383951	0.0723100	0.0800833
	25 154 46 15.4	4 44 59.1	7 26.8	6 40 23.6	10 31.0	9.5522015	0.0873559	0.0941500
	27 163 57 46.2	4 26 51.6	10 22.5	6 15 0.2	14 40.2	9.5660225	0.1004884	0.1063941
	29 172 34 39.8	4 10 18.4	12 9.7	5 42 27.9	17 41.9	9.5794918	0.1118903	0.1169986
	31 180 40 7.3	3 55 26.2	-12 51.2	+5 4 49.7	-19 48.0	9.5923442	0.1217397	0.1261333
Nov.	2 188 17 33.6	3 42 17.2	12 34.4	4 23 44.9	21 10.4	9.6043950	0.1301980	0.1339514
	4 195 30 23.1	3 30 48.6	11 29.6	3 40 30.8	21 59.0	9.6155219	0.1374085	0.1405847
	6 202 21 50.8	3 20 54.2	9 47.3	2 56 6.1	22 22.1	9.6265481	0.1434937	0.1461471
	8 208 54 57.9	3 12 26.8	7 37.8	2 11 15.2	22 26.1	9.6347300	0.1485572	0.1507338
	10 215 12 31.4	3 5 19.3	-5 10.8	+1 26 31.1	-22 16.1	9.6427453	0.1526864	0.1544234
	12 221 17 3.6	2 59 24.3	-2 34.5	+0 42 17.9	21 55.4	9.6496982	0.1559522	0.1572799
	14 227 10 53.1	2 54 35.6	+0 4.0	-0 1 5.3	21 26.7	9.6555539	0.1584126	0.1593553
	16 232 56 7.2	2 50 48.3	2 38.7	0 43 25.0	20 52.0	9.6603540	0.1601123	0.1606878
	18 238 34 44.4	2 47 57.8	5 3.9	1 24 30.0	20 12.2	9.6640941	0.1610854	0.1613072
	20 244 8 34.2	2 46 0.7	+7 15.6	-2 4 10.7	-19 27.9	9.6667819	0.1613569	0.1612346
Dec.	22 249 39 21.4	2 44 54.9	9 9.8	2 42 18.7	18 30.5	9.6684238	0.1609418	0.1604793
	24 255 8 46.8	2 44 38.6	10 43.3	3 18 45.7	17 46.8	9.6690243	0.1598465	0.1590431
	26 260 38 28.4	2 45 11.1	11 53.0	3 53 22.5	16 49.3	9.6685848	0.1580685	0.1569201
	28 266 10 3.9	2 46 32.7	12 36.7	4 25 59.2	15 46.5	9.6671039	0.1555965	0.1540943
	30 271 45 12.6	2 48 44.4	+12 52.2	-4 56 24.0	-14 37.2	9.6645781	0.1524105	0.1505411
	2 277 25 36.1	2 51 47.7	12 37.9	5 24 22.6	13 20.0	9.6610012	0.1484816	0.1462267
	4 283 12 59.6	2 55 45.2	11 53.1	5 49 37.9	11 53.5	9.6563655	0.1437705	0.1411066
	6 289 9 15.7	3 0 40.7	10 37.2	6 11 49.0	10 15.5	9.6506632	0.1382275	0.1351255
	8 295 16 23.5	3 6 37.7	8 50.2	6 30 30.4	8 23.4	9.6439882	0.1317916	0.1292160
	10 301 36 31.0	3 13 41.4	+6 34.7	-6 45 11.4	-6 14.5	9.6360385	0.1243885	0.1202975
	12 308 11 57.3	3 21 57.2	3 53.5	6 55 14.8	3 45.3	9.6271202	0.1159309	0.1112751
	14 315 5 11.6	3 31 30.5	+0 52.2	6 59 56.6	-0 52.2	9.6171527	0.1063159	0.1010385
	16 322 18 54.7	3 42 27.0	-2 21.1	6 58 25.1	+2 28.6	9.6061761	0.0954264	0.0894622
	18 329 55 58.1	3 54 51.2	5 35.0	6 49 41.0	6 20.9	9.5942617	0.0831284	0.0764064
	20 337 59 19.4	4 8 45.2	-8 34.4	-6 32 38.8	+10 47.1	9.5815220	0.0692767	0.0617205
	22 346 31 57.8	4 24 7.2	11 0.8	6 6 9.6	15 47.7	9.5681329	0.0537186	0.0452531
	24 355 36 42.0	4 40 49.3	12 32.2	5 29 7.5	21 18.8	9.5543450	0.0363076	0.0268687
	26 5 15 56.6	4 58 33.2	12 47.7	4 40 40.6	27 10.2	9.5405080	0.0189258	0.0084744
	28 15 31 14.8	5 16 46.7	11 29.5	3 40 26.0	33 2.2	9.5270824	9.9955197	9.9840754
	30 26 22 51.8	5 34 42.5	-8 31.2	-2 28 51.6	+38 24.0	9.5146418	9.9721682	9.9598419
	32 37 49 9.1	5 51 14.7	-4 5.1	-1 7 37.5	+42 34.4	9.5038485	9.9471612	9.9342133

VENUS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. 2	255 29 40.7	1 35 12.4	-0 1.3	+0 0 42.3	-5 38.7	9.8610471	0.2212851	0.2223154
6	261 50 16.9	1 35 5.9	+0 38.5	-0 21 49.3	5 36.4	9.8613063	0.2233041	0.2242513
10	268 10 28.8	1 35 0.4	1 16.5	0 44 3.3	5 30.0	9.8615408	0.2251571	0.2260213
14	274 30 21.4	1 34 56.1	1 50.6	1 5 43.7	5 19.6	9.8617479	0.2268442	0.2276252
18	280 49 59.2	1 34 53.0	2 19.3	1 26 35.0	5 5.4	9.8619252	0.2283636	0.2290596
22	287 9 26.8	1 34 51.0	+2 41.2	-1 46 22.1	-4 47.6	9.8620706	0.2297133	0.2303253
26	293 28 48.7	1 34 50.1	2 55.3	2 4 51.0	4 26.2	9.8621823	0.2308954	0.2314244
30	299 48 9.2	1 34 50.3	3 0.9	2 21 48.3	4 1.8	9.8622591	0.2319128	0.2323615
Feb. 3	306 7 32.3	1 34 51.4	2 57.8	2 37 2.0	3 34.5	9.8623001	0.2327707	0.2331401
7	312 27 1.8	1 34 53.4	2 45.9	2 50 21.1	3 4.6	9.8623047	0.2334704	0.2337606
11	318 46 40.7	1 34 56.2	+2 26.0	-3 1 35.9	-2 32.5	9.8622730	0.2340106	0.2342195
15	325 6 31.9	1 34 59.7	1 59.0	3 10 38.4	1 58.5	9.8622050	0.2343862	0.2345103
19	331 26 37.7	1 35 3.6	1 26.3	3 17 21.7	1 23.0	9.8621020	0.2345914	0.2346290
23	337 47 0.4	1 35 8.0	0 49.3	3 21 40.8	0 46.4	9.8619649	0.2346227	0.2345718
27	344 7 41.8	1 35 12.8	+0 9.9	3 23 32.2	-0 9.9	9.8617953	0.2344775	0.2343392
Mar. 3	350 28 43.2	1 35 17.9	-0 30.2	-3 22 54.3	+0 28.2	9.8615952	0.2341573	0.2339315
7	356 50 5.4	1 35 23.3	1 8.6	3 19 47.1	1 5.4	9.8613670	0.2336615	0.2333470
11	3 11 49.6	1 35 28.9	1 43.7	3 14 12.4	1 41.8	9.8611135	0.2329876	0.2325814
15	9 33 56.9	1 35 34.7	2 13.9	3 6 13.9	2 17.2	9.8608377	0.2321279	0.2316258
19	15 56 27.6	1 35 40.7	2 37.4	2 55 56.8	2 51.0	9.8605428	0.2310737	0.2304707
23	22 19 22.6	1 35 46.8	-2 53.2	-2 43 28.4	+3 22.8	9.8602327	0.2298161	0.2291091
27	28 42 42.6	1 35 53.1	3 0.5	2 28 57.2	3 52.3	9.8599108	0.2283493	0.2275363
31	35 6 28.1	1 35 59.6	2 58.8	2 12 33.7	4 19.0	9.8595813	0.2266698	0.2257500
Apr. 4	41 30 40.0	1 36 6.3	2 48.3	1 54 29.6	4 42.5	9.8592483	0.2247763	0.2237470
8	47 55 18.8	1 36 13.2	2 29.2	1 34 58.0	5 2.7	9.8589157	0.2226643	0.2215246
12	54 20 25.4	1 36 20.2	-2 2.8	-1 14 13.3	+5 19.1	9.8585880	0.2203275	0.2190714
16	60 46 0.3	1 36 27.3	1 30.2	0 52 30.8	5 31.5	9.8582690	0.2177550	0.2163769
20	67 12 3.9	1 36 34.5	0 52.9	0 30 6.8	5 39.7	9.8579632	0.2149358	0.2134309
24	73 38 36.8	1 36 41.8	-0 13.0	-0 7 18.1	5 43.7	9.8576741	0.2118609	0.2102256
28	80 5 38.7	1 36 49.1	+0 27.7	+0 15 37.9	5 43.4	9.8574058	0.2095247	0.2067578
May 2	86 33 9.6	1 36 56.3	+1 7.0	+0 38 23.6	+5 38.7	9.8571615	0.2049243	0.2030242
6	93 1 8.6	1 37 3.2	1 42.9	1 0 41.4	5 29.5	9.8569444	0.2010569	0.1990218
10	99 29 34.5	1 37 9.7	2 13.7	1 22 14.1	5 16.1	9.8567576	0.1969173	0.1947427
14	105 58 25.5	1 37 15.7	2 37.6	1 42 44.8	4 58.6	9.8566034	0.1924966	0.1901772
18	112 27 39.2	1 37 21.0	2 53.6	2 1 57.5	4 37.1	9.8564838	0.1877832	0.1853135
22	118 57 12.9	1 37 25.4	+3 0.6	+2 19 36.9	+4 19.0	9.8564005	0.1827669	0.1801428
26	125 27 2.8	1 37 28.9	2 52.4	2 35 29.3	3 43.6	9.8563545	0.1774406	0.1746597
30	131 57 4.6	1 37 31.4	2 47.1	2 49 22.0	3 12.3	9.8563464	0.1718006	0.1688626
June 3	138 27 13.8	1 37 32.8	2 27.2	3 1 4.2	2 38.4	9.8563765	0.1658457	0.1627492
7	144 57 25.3	1 37 32.7	1 59.8	3 10 26.7	2 2.5	9.8564441	0.1595729	0.1563154
11	151 27 33.8	1 37 31.2	+1 26.2	+3 17 22.3	+1 25.0	9.8565485	0.1529756	0.1495523
15	157 57 33.5	1 37 28.3	0 48.2	3 21 45.7	0 46.5	9.8566881	0.1460437	0.1424188
19	164 27 18.7	1 37 24.0	+0 7.8	3 23 33.9	+0 7.5	9.8568612	0.1387658	0.1349938
23	170 56 43.9	1 37 18.3	-0 32.9	3 22 45.6	-0 31.6	9.8570656	0.1311321	0.1271800
27	177 25 43.9	1 37 11.4	1 12.0	3 19 22.1	1 10.1	9.8572985	0.1231371	0.1190031
31	183 54 13.8	1 37 3.3	-1 47.3	+3 13 26.5	-1 47.5	9.8575568	0.1147780	0.1104617
35	190 22 9.4	1 36 54.3	-2 17.2	+3 5 3.8	-2 23.5	9.8578373	0.1060531	0.1015520

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
July 1	183 54' 13.8"	1 37' 3.3"	-1 47.3	+3 13' 28.5"	-1 47.5	9.8575568	0.1147780	0.1104617
5	190 22' 9.4"	1 36 54.3	2 17.2	3 5 3.8	2 23.5	9.8578373	0.1060531	0.1015520
9	196 49' 27.0"	1 36 44.4	2 40.1	2 54 21.2	2 57.4	9.8581363	0.0969507	0.0922657
13	203 16' 3.7"	1 36 33.9	2 54.9	2 41 27.4	3 29.0	9.8584499	0.0874774	0.0825893
17	209 41' 57.4"	1 36 23.0	3 0.8	2 26 32.8	3 57.8	9.8587741	0.0776002	0.0725077
21	216 7' 7.3"	1 36 11.9	-2 57.8	+2 9 49.3	-4 23.4	9.8591048	0.0673102	0.0620063
25	222 31' 33.0"	1 36 0.9	2 45.9	1 51 30.1	4 45.6	9.8594378	0.0565951	0.0510750
29	228 55' 15.1"	1 35 50.2	2 25.7	1 31 49.2	5 4.2	9.8597690	0.0454456	0.0397060
Aug. 2	235 18' 15.2"	1 35 40.0	1 58.3	1 11 1.7	5 18.9	9.8600942	0.0338551	0.0278915
6	241 40' 35.6"	1 35 30.4	1 25.1	0 49 23.4	5 29.6	9.8604094	0.0218136	0.0156190
10	248 2' 19.3"	1 35 21.6	-0 47.9	+0 27 10.4	-5 36.2	9.8607108	0.0093049	0.0028680
14	254 23' 29.7"	1 35 13.8	-0 8.3	+0 4 39.1	5 36.7	9.8609948	9.9963053	9.9896132
18	260 44' 10.9"	1 35 7.0	+0 31.7	-0 17 53.8	5 37.1	9.8612577	9.9827880	9.9758267
22	267 4' 27.3"	1 35 1.3	1 10.0	0 40 12.1	5 31.4	9.8614968	9.9687260	9.9614833
26	273 24' 23.4"	1 34 56.8	1 44.9	1 1 59.6	5 21.7	9.8617088	9.9540980	9.9465615
30	279 44' 3.8"	1 34 53.5	+2 14.7	-1 23 0.6	-5 8.2	9.8618913	9.9388776	9.9310412
Sept. 3	286 3' 33.3"	1 34 51.4	2 37.9	1 43 0.0	4 50.9	9.8620422	9.9230400	9.9148974
7	292 22' 56.5"	1 34 50.3	2 53.4	2 1 43.5	4 30.2	9.8621598	9.9065819	9.8980969
11	298 42' 17.4"	1 34 50.3	3 0.6	2 18 57.7	4 6.3	9.8622427	9.8894374	9.8805971
15	305 1' 40.4"	1 34 51.3	2 58.9	2 34 30.3	3 30.5	9.8622809	9.8715695	9.8623485
19	311 21' 9.1"	1 34 53.2	+2 48.5	-2 48 10.2	-3 10.0	9.8623008	9.8529278	9.8433020
23	317 40' 46.7"	1 34 55.8	2 30.0	2 59 47.4	2 38.2	9.8622753	9.8334692	9.8234205
27	324 0' 36.1"	1 34 59.1	2 4.2	3 9 13.5	2 4.5	9.8622136	9.8131535	9.8026636
Oct. 1	330 20' 39.9"	1 35 3.0	1 32.4	3 16 21.5	1 20.2	9.8621167	9.7919464	9.7809982
5	336 41' 0.3"	1 35 7.3	0 55.9	3 21 6.0	0 52.8	9.8619854	9.7698144	9.7583895
9	343 1' 38.9"	1 35 12.2	+0 16.8	-3 23 23.4	-0 15.7	9.8618216	9.7467189	9.7347906
13	349 22' 37.1"	1 35 17.1	-0 23.2	3 23 11.6	+0 21.7	9.8616271	9.7226187	9.7101824
17	355 43' 56.1"	1 35 22.5	1 2.0	3 20 30.3	0 58.9	9.8614041	9.6974861	9.6845311
21	2 5' 37.1"	1 35 28.0	1 37.9	3 15 21.2	1 36.6	9.8611554	9.6713224	9.6578695
25	8 27' 40.7"	1 35 33.8	2 9.1	3 7 47.3	2 11.2	9.8608839	9.6441850	9.6302872
29	14 50' 7.6"	1 35 39.7	-2 33.8	-2 57 54.0	+2 45.2	9.8605929	9.6162011	9.6019591
Nov. 2	21 12' 58.6"	1 35 45.8	2 51.0	2 45 47.8	3 17.5	9.8602859	9.5875997	9.5731690
6	27 36' 14.4"	1 35 52.1	2 59.9	2 31 37.4	3 47.4	9.8599667	9.5587249	9.5443378
10	33 59' 55.6"	1 35 58.6	2 59.8	2 15 32.6	4 14.6	9.8596393	9.5300913	9.5160858
14	40 24' 2.9"	1 36 5.2	2 50.7	1 57 45.1	4 38.7	9.8593077	9.5024412	9.4892948
18	46 48' 37.0"	1 36 11.9	-2 33.2	-1 38 27.7	+4 50.4	9.8589760	9.4768065	9.4651529
22	53 13' 38.4"	1 36 18.9	2 7.9	1 17 54.7	5 16.5	9.8586185	9.4545248	9.4451221
26	59 39' 8.0"	1 36 26.0	1 36.2	0 56 21.2	5 20.6	9.8583293	9.4371406	9.4307628
30	66 5' 6.3"	1 36 33.2	0 59.7	0 34 3.2	5 36.7	9.8580225	9.4261452	9.4234052
Dec. 4	72 31' 33.3"	1 36 40.4	-0 20.0	-0 11 17.6	5 43.4	9.8577319	9.4226124	9.4237856
8	78 58' 29.4"	1 36 47.6	+0 20.6	+0 11 38.3	+5 43.8	9.8574614	9.4268873	9.4318321
12	85 25' 54.3"	1 36 54.8	1 0.4	0 34 27.0	5 39.8	9.8572144	9.4384935	9.4467140
16	91 53' 47.2"	1 37 1.7	1 37.0	0 56 50.9	5 31.4	9.8569943	9.4563148	9.4671084
20	98 22' 7.0"	1 37 8.2	2 8.8	1 18 32.6	5 18.7	9.8568038	9.4789060	9.4915239
24	104 50' 52.2"	1 37 14.3	2 34.0	1 39 15.2	5 1.9	9.8566456	9.5047910	9.5185504
28	111 20' 0.4"	1 37 19.7	+2 51.4	+1 58 42.6	+4 41.1	9.8565215	9.5326612	9.5470009
32	117 49' 28.7"	1 37 24.4	+3 0.1	+2 16 39.2	+4 16.6	9.8564333	9.5614632	9.5759595

MARS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. 2	176 32 15.8	26 36.55	-52.2	+1 27 41.7	-31.63	0.2182404	0.2255722	0.2204636
6	178 18 49.8	26 40.46	53.0	1 25 32.5	32.95	0.2176962	0.2153092	0.2100472
10	180 5 40.0	26 44.71	53.5	1 23 18.1	34.25	0.2171123	0.2046969	0.1992559
14	181 52 47.9	26 49.29	53.8	1 20 58.5	35.55	0.2164891	0.1937233	0.1880977
18	183 40 14.7	26 54.15	53.9	1 18 33.7	36.82	0.2158271	0.1823789	0.1765657
22	185 28 1.5	26 59.31	-53.8	+1 16 3.9	-38.09	0.2151263	0.1706586	0.1646570
26	187 16 9.6	27 4.81	53.5	1 13 29.0	39.34	0.2143873	0.1585606	0.1523696
30	189 4 40.4	27 10.59	53.0	1 10 49.2	40.55	0.2136104	0.1460835	0.1397016
Feb. 3	190 53 34.7	27 16.85	52.2	1 8 4.6	41.75	0.2127962	0.1332227	0.1266449
7	192 42 54.0	27 23.01	51.2	1 5 15.2	42.92	0.2119450	0.1199667	0.1131869
11	194 32 39.2	27 29.66	-50.1	+1 2 21.2	-44.09	0.2110575	0.1063043	0.0993172
15	196 22 51.7	27 36.64	48.7	0 59 22.5	45.21	0.2101341	0.0922254	0.0850288
19	198 13 32.7	27 43.94	47.1	0 56 19.5	46.30	0.2091753	0.0777280	0.0703236
23	200 4 43.6	27 51.50	45.4	0 53 12.1	47.39	0.2081820	0.0628160	0.0552056
27	201 56 25.1	27 59.35	43.4	0 50 0.4	48.42	0.2071547	0.0474932	0.0396794
Mar. 3	203 48 38.8	28 7.59	-41.2	+0 46 44.7	-49.44	0.2060941	0.0317635	0.0237451
7	205 41 25.7	28 16.00	38.8	0 43 24.9	50.41	0.2050008	0.0156241	0.0074012
11	207 34 47.2	28 24.80	36.3	0 40 1.4	51.36	0.2038758	0.9990753	0.99906481
15	209 28 44.5	28 33.86	33.5	0 36 34.0	52.27	0.2027200	0.9821206	0.9734960
19	211 23 18.5	28 43.17	30.7	0 33 3.2	53.12	0.2015343	0.9647779	0.9559695
23	213 18 30.3	28 52.79	-27.6	+0 29 29.0	-53.96	0.2003192	0.9470773	0.9381056
27	215 14 21.2	29 2.74	24.4	0 25 51.5	54.74	0.1990760	0.9290600	0.9199468
31	217 10 52.6	29 12.92	21.1	0 22 11.1	55.47	0.1978059	0.9107717	0.9015398
Apr. 4	219 8 5.0	29 23.36	17.6	0 18 27.7	56.17	0.1965097	0.8922588	0.8829366
8	221 5 59.9	29 34.14	14.1	0 14 41.7	56.80	0.1951890	0.8735814	0.8642045
12	223 4 38.5	29 45.12	-10.5	+0 10 53.3	-57.37	0.1938447	0.8548184	0.8454389
16	225 4 1.3	29 56.35	6.8	0 7 2.7	57.90	0.1924781	0.8360822	0.8267675
20	227 4 9.7	30 7.87	-3.1	+0 3 10.1	58.37	0.1910904	0.8175155	0.8083513
24	229 5 4.7	30 19.64	+0.7	-0 0 44.3	58.77	0.1896831	0.7992267	0.7903763
28	231 6 47.1	30 31.61	4.5	0 4 40.1	59.10	0.1882579	0.7816161	0.7730422
May 2	233 9 17.9	30 43.81	+8.3	-0 8 37.1	-59.37	0.1868163	0.7646830	0.7565688
6	235 12 37.9	30 56.94	12.1	0 12 35.1	59.57	0.1853600	0.7487278	0.7411945
10	237 16 48.1	31 8.85	15.9	0 16 33.7	59.69	0.1838904	0.7340044	0.7271908
14	239 21 49.0	31 21.67	19.6	0 20 32.6	59.72	0.1824093	0.7207928	0.7148450
18	241 27 41.8	31 34.69	23.2	0 24 31.5	59.67	0.1809188	0.7093821	0.7044349
22	243 34 26.8	31 47.81	+26.7	-0 28 30.0	-59.55	0.1794206	0.7000307	0.6961931
26	245 42 4.5	32 1.11	30.2	0 32 27.9	59.34	0.1779165	0.6929387	0.6902818
30	247 50 35.9	32 14.55	33.4	0 36 24.7	59.02	0.1764090	0.6882290	0.6867824
June 3	250 0 1.1	32 28.09	36.5	0 40 20.1	58.61	0.1749000	0.6859418	0.6857005
7	252 10 20.8	32 41.74	39.4	0 44 13.6	58.10	0.1733915	0.6860502	0.6869789
11	254 21 35.1	32 55.43	+42.1	-0 48 4.9	-57.50	0.1718861	0.6884692	0.6905006
15	256 33 44.3	33 9.19	44.6	0 51 53.5	56.79	0.1703860	0.6930476	0.6960636
19	258 46 48.7	33 23.01	46.8	0 55 39.2	55.97	0.1688934	0.6995752	0.7034873
23	261 0 48.4	33 36.80	48.7	0 59 21.3	55.02	0.1674110	0.7077856	0.7124347
27	263 15 43.1	33 50.56	50.3	1 2 59.4	53.99	0.1659411	0.7173978	0.7226416
July 1	265 31 32.8	34 4.27	+51.7	-1 6 33.2	-52.84	0.1644866	0.7281345	0.7338473
5	267 48 17.2	34 17.99	+52.8	-1 10 2.1	-51.55	0.1630496	0.7397543	0.7456295

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
July 1	265 31 32.8	34 4.97	+51.7	-1 6 33.2	-52.84	0.1644866	9.7281345	9.7338473
5	267 48 17.2	34 17.92	52.8	1 10 2.1	51.55	0.1630496	9.7397543	9.7458295
9	270 5 56.1	34 31.49	53.5	1 13 25.6	50.15	0.1616332	9.7520513	9.7583982
13	272 24 28.9	34 44.92	53.9	1 16 43.3	48.65	0.1602398	9.7648496	9.7713846
17	274 43 55.3	34 58.19	53.9	1 19 54.8	47.02	0.1588724	9.7779864	9.7846362
21	277 4 14.2	35 11.25	+53.5	-1 22 59.5	-45.26	0.1575332	9.7913185	9.7980174
25	279 25 25.0	35 24.11	52.8	1 25 56.9	43.40	0.1562251	9.8047202	9.8114168
29	281 47 26.8	35 36.70	51.7	1 28 46.7	41.41	0.1549513	9.8180062	9.8247523
Aug. 2	284 10 18.2	35 49.00	50.3	1 31 28.2	39.30	0.1537141	9.8313799	9.8379739
6	286 33 58.4	36 0.99	48.5	1 34 1.1	37.10	0.1525164	9.8445319	9.8510499
10	288 58 25.6	36 12.59	+46.4	-1 36 25.0	-34.77	0.1513609	9.8575257	9.8639546
14	291 23 38.6	36 23.82	43.9	1 38 39.3	32.32	0.1502496	9.8703339	9.8766617
18	293 49 35.6	36 34.59	41.1	1 40 43.6	29.77	0.1491862	9.8829337	9.8891471
22	296 16 14.7	36 44.92	38.1	1 42 37.5	27.15	0.1481726	9.8953002	9.9013920
26	298 43 34.4	36 54.79	34.6	1 44 20.8	24.42	0.1472111	9.9074210	9.9133892
30	301 11 32.4	37 4.12	+30.9	-1 45 52.9	-21.59	0.1463045	9.9192970	9.9251451
Sept. 3	303 40 6.8	37 12.90	26.9	1 47 13.5	18.67	0.1454547	9.9309371	9.9366738
7	306 9 14.9	37 21.06	22.8	1 48 22.3	15.70	0.1446642	9.9423571	9.9479864
11	308 38 54.6	37 28.67	18.5	1 49 19.1	12.66	0.1439347	9.9535638	9.9590687
15	311 9 3.5	37 35.60	14.0	1 50 3.6	9.56	0.1432683	9.9645614	9.9699812
19	313 39 38.6	37 41.87	+ 9.5	-1 50 35.6	- 6.42	0.1426669	9.9753482	9.9806644
23	316 10 37.6	37 47.47	+ 4.8	1 50 55.0	- 3.22	0.1421318	9.9859288	9.9911433
27	318 41 57.5	37 52.34	0.0	1 51 1.4	0.00	0.1416648	9.9963103	0.0014315
Oct. 1	321 13 35.4	37 56.50	- 4.7	1 50 55.0	+ 3.22	0.1412670	0.0065090	0.0115451
5	323 45 28.6	37 59.94	9.5	1 50 35.6	6.47	0.1409392	0.0165417	0.0215007
9	326 17 33.9	38 2.64	-14.1	-1 50 3.2	+ 9.72	0.1406829	0.0264222	0.0313065
13	328 49 48.7	38 4.57	18.6	1 49 17.8	12.25	0.1404984	0.0361541	0.0409650
17	331 22 9.5	38 5.69	23.0	1 48 19.6	16.15	0.1403864	0.0457391	0.0504765
21	333 54 33.2	38 6.06	27.2	1 47 8.6	19.35	0.1403467	0.0551784	0.0598450
25	336 26 57.0	38 5.65	31.3	1 45 44.8	22.49	0.1403801	0.0644781	0.0690787
29	338 59 17.4	38 4.47	-35.0	-1 44 8.7	+25.54	0.1404862	0.0736484	0.0781892
Nov. 2	341 31 31.8	38 2.57	38.6	1 42 20.5	28.55	0.1406649	0.0827025	0.0871890
6	344 3 37.0	37 59.89	41.7	1 40 20.3	31.50	0.1409154	0.0916494	0.0960639
10	346 35 29.9	37 56.41	44.6	1 38 8.5	34.35	0.1412372	0.1004923	0.1048744
14	349 7 7.3	37 52.17	47.1	1 35 45.5	37.11	0.1416293	0.1092298	0.1135577
18	351 39 26.3	37 47.98	-49.1	-1 33 11.6	+39.77	0.1420905	0.1178588	0.1221326
22	354 9 24.4	37 41.67	50.9	1 30 27.3	42.32	0.1426196	0.1263797	0.1306011
26	356 39 58.7	37 35.38	52.3	1 27 33.0	44.76	0.1432155	0.1347979	0.1389714
30	359 10 6.3	37 28.40	53.2	1 24 29.2	47.09	0.1438764	0.1431217	0.1472498
Dec. 4	1 39 45.0	37 20.79	53.8	1 21 16.3	49.29	0.1446005	0.1513558	0.1554399
8	4 8 52.1	37 12.57	-53.9	-1 17 54.9	+51.34	0.1453858	0.1595015	0.1635404
12	6 37 24.9	37 3.82	53.6	1 14 25.6	53.26	0.1462305	0.1675555	0.1715452
16	9 5 21.9	36 54.52	53.0	1 10 48.8	55.06	0.1471323	0.1755099	0.1794495
20	11 32 40.4	36 44.70	51.9	1 7 5.1	56.71	0.1480886	0.1833633	0.1872521
24	13 59 18.8	36 34.39	50.4	1 3 15.1	58.22	0.1490976	0.1911159	0.1949560
28	16 25 14.8	36 23.63	-48.6	-0 59 19.3	+59.80	0.1501567	0.1987723	0.2025658
32	18 50 27.1	36 12.46	-46.6	-0 55 18.3	+60.89	0.1512632	0.2063358	

JUPITER.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Inter- mediate Date.
Jan. 2	289 20' 45.2	5 3.74	+ 9.3	-0 13' 45.4	-6.83	0.7126661	0.7879445	0.7881026
6	289 41 0.5	5 3.91	9.6	0 14 12.7	6.83	0.7125426	0.7882005	0.7882380
10	290 1 16.5	5 4.09	9.9	0 14 40.0	6.83	0.7124191	0.7882154	0.7881322
14	290 21 33.2	5 4.96	10.2	0 15 7.3	6.82	0.7122957	0.7879885	0.7877839
18	290 41 50.6	5 4.43	10.5	0 15 34.6	6.82	0.7121723	0.7875185	0.7871922
22	291 2 8.7	5 4.60	+10.8	-0 16 1.9	-6.82	0.7120490	0.7868050	0.7863568
26	291 22 27.4	5 4.78	11.1	0 16 29.2	6.81	0.7119257	0.7858481	0.7852794
30	291 42 46.9	5 4.95	11.4	0 16 56.4	6.81	0.7118025	0.7846509	0.7839630
Feb. 3	292 3 7.1	5 5.13	11.7	0 17 23.6	6.80	0.7116794	0.7832157	0.7824095
7	292 23 27.9	5 5.30	12.0	0 17 50.8	6.79	0.7115564	0.7815444	0.7806208
11	292 43 49.5	5 5.47	+12.3	-0 18 17.9	-6.78	0.7114335	0.7796387	0.7785979
15	293 4 11.7	5 5.65	12.6	0 18 45.1	6.78	0.7113106	0.7774987	0.7763413
19	293 24 34.6	5 5.82	12.8	0 19 12.2	6.77	0.7111878	0.7751262	0.7738536
23	293 44 58.3	5 5.99	13.1	0 19 39.3	6.77	0.7110651	0.7725242	0.7711385
27	294 5 22.6	5 6.17	13.4	0 20 6.3	6.76	0.7109425	0.7696971	0.7682007
Mar. 3	294 25 47.6	5 6.34	+13.7	-0 20 33.4	-6.76	0.7108200	0.7666499	0.7650452
7	294 46 13.3	5 6.51	14.0	0 21 0.4	6.75	0.7106975	0.7633876	0.7616769
11	295 6 39.7	5 6.68	14.2	0 21 27.4	6.74	0.7105751	0.7599137	0.7580984
15	295 27 6.8	5 6.86	14.5	0 21 54.3	6.73	0.7104529	0.7562318	0.7543144
19	295 47 34.6	5 7.03	14.8	0 22 21.2	6.72	0.7103308	0.7523471	0.7503305
23	296 8 3.0	5 7.20	+15.0	-0 22 48.1	-6.72	0.7102089	0.7482657	0.7461537
27	296 28 32.2	5 7.38	15.3	0 23 15.0	6.71	0.7100872	0.7439958	0.7417933
31	296 49 2.0	5 7.55	15.6	0 23 41.8	6.70	0.7099655	0.7395473	0.7372587
Apr. 4	297 9 32.6	5 7.72	15.8	0 24 8.6	6.69	0.7098441	0.7349287	0.7325585
8	297 30 3.8	5 7.89	16.1	0 24 35.3	6.68	0.7097223	0.7301491	0.7277016
12	297 50 35.7	5 8.07	+16.4	-0 25 2.0	-6.67	0.7096016	0.7252173	0.7226975
16	298 11 8.3	5 8.24	16.7	0 25 28.7	6.66	0.7094803	0.7201439	0.7175581
20	298 31 41.6	5 8.41	16.9	0 25 55.3	6.65	0.7093601	0.7149420	0.7122976
24	298 52 15.6	5 8.58	17.1	0 26 21.9	6.64	0.7092397	0.7096271	0.7069327
28	299 12 50.2	5 8.75	17.4	-0 26 48.5	6.63	0.7091195	0.7042165	0.7014805
May 2	299 33 25.6	5 8.92	+17.6	-0 27 15.0	-6.62	0.7089994	0.6987271	0.6959583
6	299 54 1.6	5 9.09	17.9	0 27 41.4	6.61	0.7088796	0.6931765	0.6903838
10	300 14 38.3	5 9.26	18.1	0 28 7.8	6.60	0.7087600	0.6875828	0.6847758
14	300 35 15.7	5 9.44	18.4	0 28 34.2	6.59	0.7086407	0.6819664	0.6791571
18	300 55 53.8	5 9.61	18.6	0 29 0.5	6.58	0.7085215	0.6763516	0.6735531
22	301 16 32.6	5 9.78	+18.8	-0 29 26.8	-6.57	0.7084025	0.6707652	0.6679915
26	301 37 12.0	5 9.95	19.1	0 29 53.1	6.55	0.7082838	0.6652356	0.6625012
30	301 57 52.2	5 10.12	19.3	0 30 19.2	6.54	0.7081653	0.6597917	0.6571108
June 3	302 18 33.0	5 10.29	19.5	0 30 45.3	6.53	0.7080471	0.6544620	0.6518490
7	302 39 14.5	5 10.46	19.7	0 31 11.4	6.51	0.7079290	0.6492758	0.6467463
11	302 59 56.6	5 10.62	+20.0	-0 31 37.4	-6.49	0.7078112	0.6442649	0.6418359
15	303 20 39.5	5 10.79	20.2	0 32 3.4	6.48	0.7076937	0.6394638	0.6371533
19	303 41 23.0	5 10.96	20.4	0 32 29.3	6.47	0.7075763	0.6349087	0.6327348
23	304 2 7.2	5 11.13	20.6	0 32 55.1	6.45	0.7074592	0.6306354	0.6286152
27	304 22 52.0	5 11.30	20.8	0 33 20.9	6.44	0.7073423	0.6266779	0.6248272
July 1	304 43 37.6	5 11.47	+21.1	-0 33 46.7	-6.42	0.7072257	0.6230667	0.6214003
5	305 4 23.8	5 11.64	+21.3	-0 34 12.4	-6.41	0.7071091	0.6198315	0.6183639

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
July 1	304 43 37.6	5 11.47	+21.1	0 33 46.7	-6.42	0.7072257	0.6230667	0.6214003
5	305 4 23.8	5 11.64	21.3	0 34 12.4	6.41	0.7071091	0.6198315	0.6183639
9	305 25 10.7	5 11.81	21.5	0 34 38.0	6.39	0.7069928	0.6170009	0.6157462
13	305 45 58.3	5 11.97	21.7	0 35 3.5	6.37	0.7068768	0.6146028	0.6135743
17	306 6 46.5	5 12.14	21.8	0 35 29.0	6.36	0.7067611	0.6126630	0.6118717
21	306 27 35.4	5 12.31	+22.0	-0 35 54.4	-6.34	0.7066456	0.6112018	0.6106555
25	306 48 24.9	5 12.47	22.2	0 36 19.7	6.32	0.7065304	0.6102334	0.6099369
29	307 9 15.2	5 12.64	22.4	0 36 45.0	6.31	0.7064155	0.6097658	0.6097207
Aug. 2	307 30 6.1	5 12.80	22.6	0 37 10.2	6.29	0.7063008	0.6098013	0.6100079
6	307 50 57.6	5 12.97	22.8	0 37 35.4	6.27	0.7061864	0.6103397	0.6107964
10	308 11 49.8	5 13.14	+23.0	-0 38 0.5	-6.26	0.7060723	0.6113767	0.6120800
14	308 32 42.7	5 13.30	23.1	0 38 25.5	6.24	0.7059586	0.6129041	0.6138474
18	308 53 36.3	5 13.46	23.3	0 38 50.4	6.22	0.7058452	0.6149069	0.6160800
22	309 14 30.4	5 13.63	23.5	0 39 15.3	6.20	0.7057321	0.6173634	0.6187540
26	309 35 25.3	5 13.80	23.6	0 39 40.1	6.18	0.7056194	0.6202478	0.6218413
30	309 56 20.8	5 13.96	+23.8	-0 40 4.8	-6.16	0.7055070	0.6235306	0.6253121
Sept. 3	310 17 16.9	5 14.12	23.9	0 40 29.4	6.14	0.7053949	0.6271820	0.6291366
7	310 38 13.7	5 14.28	24.1	0 40 54.0	6.12	0.7052831	0.6311717	0.6332833
11	310 59 11.1	5 14.44	24.3	0 41 18.5	6.11	0.7051717	0.6354673	0.6377199
15	311 20 9.3	5 14.61	24.4	0 41 42.9	6.09	0.7050606	0.6400362	0.6424113
19	311 41 8.0	5 14.77	+24.6	-0 42 7.2	-6.07	0.7049496	0.6448407	0.6473195
23	312 2 7.5	5 14.93	24.7	0 42 31.5	6.05	0.7048393	0.6498435	0.6524033
27	312 23 7.5	5 15.09	24.8	0 42 55.6	6.03	0.7047292	0.6550099	0.6576438
Oct. 1	312 44 8.2	5 15.25	24.9	0 43 19.7	6.01	0.7046194	0.6603067	0.6629949
5	313 5 9.5	5 15.41	25.1	0 43 43.7	5.99	0.7045100	0.6657046	0.6684320
9	313 26 11.5	5 15.57	+25.2	-0 44 7.6	-5.98	0.7044010	0.6711737	0.6739262
13	313 47 14.1	5 15.73	25.3	0 44 31.4	5.94	0.7042923	0.6766858	0.6794466
17	314 8 17.3	5 15.89	25.4	0 44 55.1	5.92	0.7041841	0.6822119	0.6849713
21	314 29 21.2	5 16.05	25.6	0 45 18.8	5.89	0.7040762	0.6877242	0.6904674
25	314 50 25.7	5 16.21	25.7	0 45 42.3	5.87	0.7039686	0.6931984	0.6959144
29	315 11 30.9	5 16.36	+25.8	-0 46 5.8	-5.85	0.7038615	0.6986132	0.7012926
Nov. 2	315 32 36.6	5 16.52	25.9	0 46 29.1	5.82	0.7037548	0.7039504	0.7065846
6	315 53 43.0	5 16.67	26.0	0 46 52.4	5.80	0.7036485	0.7091930	0.7117733
10	316 14 50.0	5 16.82	26.1	0 47 15.6	5.78	0.7035426	0.7143234	0.7168413
14	316 35 57.6	5 16.98	26.2	0 47 38.7	5.75	0.7034372	0.7193250	0.7217724
18	316 57 5.8	5 17.13	+26.3	-0 48 1.6	-5.73	0.7033322	0.7241820	0.7265521
22	317 18 14.6	5 17.29	26.3	0 48 24.5	5.70	0.7032277	0.7288812	0.7311681
26	317 39 24.1	5 17.44	26.4	0 48 47.3	5.68	0.7031235	0.7334118	0.7356112
30	318 0 34.2	5 17.59	26.5	0 49 10.0	5.66	0.7030198	0.7377653	0.7398732
Dec. 4	318 21 44.8	5 17.75	26.6	0 49 32.6	5.63	0.7029165	0.7419338	0.7439461
8	318 42 56.1	5 17.90	+26.6	-0 49 55.0	-5.61	0.7028137	0.7459090	0.7478213
12	319 4 8.1	5 18.05	26.7	0 50 17.4	5.58	0.7027114	0.7496820	0.7514899
16	319 25 20.6	5 18.20	26.7	0 50 39.7	5.55	0.7026095	0.7532444	0.7549448
20	319 46 33.7	5 18.35	26.8	0 51 1.9	5.53	0.7025081	0.7565905	0.7581812
24	320 7 47.4	5 18.50	26.8	0 51 24.0	5.50	0.7024072	0.7597164	0.7611957
28	320 20 1.7	5 18.65	+26.9	-0 51 45.9	-5.48	0.7023067	0.7626186	0.7639855
32	320 50 16.6	5 18.80	+26.9	-0 52 7.8	-5.45	0.7022067	0.7652053	

SATURN.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. 2	148° 48' 24.1"	2 8.18	+1 33.0	+1 28' 4.3"	+4.50	0.9656998	0.9343048	0.9330146
6	148 56 56.8	2 8.15	1 33.1	1 28 22.5	4.49	0.9657476	0.9317612	0.9305463
10	149 5 29.3	2 8.13	1 33.3	1 28 40.4	4.48	0.9657956	0.9293722	0.9282409
14	149 14 1.8	2 8.11	1 33.4	1 28 58.3	4.48	0.9658436	0.9271546	0.9261154
18	149 22 34.2	2 8.08	1 33.6	1 29 16.2	4.47	0.9658916	0.9251252	0.9241864
22	149 31 6.5	2 8.05	+1 33.7	+1 29 34.1	+4.46	0.9659397	0.9233004	0.9224694
26	149 39 38.6	2 8.01	1 33.9	1 29 51.9	4.45	0.9659878	0.9216946	0.9209777
30	149 48 10.6	2 7.98	1 34.0	1 30 9.7	4.44	0.9660361	0.9203198	0.9197227
Feb. 3	149 56 42.5	2 7.95	1 34.1	1 30 27.4	4.43	0.9660844	0.9191868	0.9187130
7	150 5 14.3	2 7.93	1 34.2	1 30 45.1	4.42	0.9661328	0.9183023	0.9179557
11	150 13 46.0	2 7.90	+1 34.4	+1 31 2.8	+4.41	0.9661812	0.9176737	0.9174573
15	150 22 17.5	2 7.87	1 34.5	1 31 20.4	4.40	0.9662298	0.9173066	0.9172224
19	150 30 48.9	2 7.84	1 34.6	1 31 38.0	4.39	0.9662783	0.9172047	0.9172538
23	150 39 20.2	2 7.81	1 34.7	1 31 55.5	4.38	0.9663270	0.9173692	0.9175506
27	150 47 51.4	2 7.78	1 34.8	1 32 13.0	4.37	0.9663758	0.9177975	0.9181093
Mar. 3	150 56 22.5	2 7.75	+1 34.9	+1 32 30.5	+4.36	0.9664246	0.9184850	0.9189237
7	151 4 53.5	2 7.72	1 35.0	1 32 47.9	4.35	0.9664736	0.9194244	0.9199663
11	151 13 24.4	2 7.70	1 35.2	1 33 5.3	4.34	0.9665225	0.9206081	0.9212889
15	151 21 55.1	2 7.67	1 35.3	1 33 22.7	4.33	0.9665715	0.9220273	0.9228222
19	151 30 25.7	2 7.64	1 35.4	1 33 40.0	4.32	0.9666206	0.9236716	0.9245743
23	151 38 56.3	2 7.61	+1 35.5	+1 33 57.3	+4.32	0.9666697	0.9255283	0.9265318
27	151 47 26.7	2 7.58	1 35.6	1 34 14.5	4.31	0.9667189	0.9275927	0.9286791
31	151 55 57.0	2 7.55	1 35.7	1 34 31.7	4.30	0.9667682	0.9298187	0.9309995
Apr. 4	152 4 27.1	2 7.52	1 35.8	1 34 48.9	4.29	0.9668175	0.9322196	0.9334770
8	152 12 57.2	2 7.50	1 35.9	1 35 6.0	4.28	0.9668669	0.9347696	0.9360954
12	152 21 27.2	2 7.47	+1 36.0	+1 35 23.1	+4.27	0.9669164	0.9374525	0.9388388
16	152 29 57.0	2 7.44	1 36.1	1 35 40.2	4.26	0.9669660	0.9402524	0.9416910
20	152 38 26.7	2 7.41	1 36.2	1 35 57.2	4.25	0.9670156	0.9431525	0.9446344
24	152 46 56.3	2 7.38	1 36.3	1 36 14.2	4.24	0.9670653	0.9461349	0.9476514
28	152 55 25.8	2 7.35	1 36.4	1 36 31.1	4.23	0.9671150	0.9491820	0.9507245
May 2	153 3 55.2	2 7.32	+1 36.4	+1 36 48.0	+4.22	0.9671647	0.9522773	0.9538382
6	153 12 24.4	2 7.29	1 36.5	1 37 4.8	4.21	0.9672145	0.9554055	0.9569775
10	153 20 53.5	2 7.26	1 36.6	1 37 21.6	4.20	0.9672644	0.9585525	0.9601287
14	153 29 22.5	2 7.23	1 36.6	1 37 38.4	4.19	0.9673144	0.9617044	0.9632779
18	153 37 51.4	2 7.20	1 36.7	1 37 55.1	4.18	0.9673644	0.9648475	0.9664113
22	153 46 20.1	2 7.17	+1 36.8	+1 38 11.8	+4.17	0.9674145	0.9679678	0.9695152
26	153 54 48.8	2 7.15	1 36.8	1 38 28.5	4.16	0.9674647	0.9710521	0.9725767
30	154 3 17.4	2 7.12	1 36.9	1 38 45.1	4.15	0.9675149	0.9740880	0.9755846
June 3	154 11 45.8	2 7.09	1 37.0	1 39 1.7	4.14	0.9675652	0.9770654	0.9785291
7	154 20 14.1	2 7.06	1 37.0	1 39 18.2	4.13	0.9676155	0.9799748	0.9814013
11	154 28 42.3	2 7.03	+1 37.1	+1 39 34.7	+4.12	0.9676658	0.9829075	0.9841922
15	154 37 10.4	2 7.00	1 37.1	1 39 51.2	4.11	0.9677163	0.9855543	0.9868923
19	154 45 38.4	2 6.97	1 37.2	1 40 7.6	4.10	0.9677667	0.9882056	0.9894932
23	154 54 6.2	2 6.94	1 37.2	1 40 24.0	4.09	0.9678173	0.9907543	0.9919877
27	155 2 33.9	2 6.91	1 37.3	1 40 40.3	4.08	0.9678679	0.9931926	0.9943680
July 1	155 11 1.5	2 6.88	+1 37.3	+1 40 56.6	+4.07	0.9679185	0.9955137	0.9968291
5	155 19 29.0	2 6.85	+1 37.3	+1 41 12.9	+4.06	0.9679693	0.9977135	0.9987662

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"						At Date.	At Intermediate Date.
July 1	155	11	1.5	2 6.88	+1 37.3	+1 40 56.6	+4.07	0.9679185	0.9955137	0.9966391
5	155	19	29.0	2 6.85	1 37.3	1 41 12.9	4.06	0.9679693	0.9977135	0.9987662
9	155	27	56.4	2 6.83	1 37.4	1 41 29.1	4.05	0.9680201	0.9997666	1.0007741
13	155	36	23.7	2 6.79	1 37.4	1 41 45.2	4.04	0.9680709	1.0017278	1.0026473
17	155	44	50.8	2 6.76	1 37.4	1 42 1.4	4.03	0.9681219	1.0035319	1.0043809
21	155	53	17.8	2 6.73	+1 37.4	+1 42 17.5	+4.03	0.9681727	1.0051938	1.0059702
25	156	1	44.7	2 6.70	1 37.5	1 42 33.5	4.01	0.9682238	1.0067096	1.0074190
29	156	10	11.4	2 6.67	1 37.5	1 42 49.5	4.00	0.9682748	1.0080769	1.0087041
Aug. 2	156	18	38.1	2 6.65	1 37.5	1 43 5.5	3.99	0.9683260	1.0092935	1.0098444
6	156	27	4.6	2 6.62	1 37.5	1 43 21.4	3.98	0.9683772	1.0103567	1.0108300
10	156	35	31.0	2 6.59	+1 37.5	+1 43 37.3	+3.97	0.9684283	1.0112642	1.0116586
14	156	43	55.3	2 6.56	1 37.5	1 43 53.1	3.96	0.9684796	1.0120132	1.0123272
18	156	52	23.5	2 6.53	1 37.6	1 44 8.9	3.95	0.9685309	1.0126008	1.0128337
22	157	0	49.6	2 6.50	1 37.6	1 44 24.7	3.93	0.9685824	1.0130259	1.0131774
26	157	9	15.5	2 6.47	1 37.6	1 44 40.4	3.92	0.9686337	1.0139879	1.0133577
30	157	17	41.3	2 6.44	+1 37.6	+1 44 56.1	+3.91	0.9686852	1.0133868	1.0133752
Sept. 3	157	26	7.0	2 6.41	1 37.6	1 45 11.7	3.90	0.9687367	1.0133228	1.0133294
7	157	34	32.6	2 6.38	1 37.6	1 45 27.3	3.89	0.9687883	1.0130949	1.0129192
11	157	42	58.0	2 6.35	1 37.7	1 45 42.9	3.88	0.9688400	1.0127023	1.0124443
15	157	51	23.4	2 6.32	1 37.7	1 45 58.4	3.87	0.9688916	1.0121451	1.0118047
19	157	59	48.6	2 6.29	+1 37.7	+1 46 13.9	+3.86	0.9689434	1.0114236	1.0110019
23	158	8	13.7	2 6.26	1 37.7	1 46 29.3	3.85	0.9689951	1.0105401	1.0100381
27	158	16	38.6	2 6.23	1 37.7	1 46 44.7	3.84	0.9690470	1.0094965	1.0089155
Oct. 1	158	25	3.5	2 6.20	1 37.6	1 47 0.0	3.83	0.9690990	1.0082954	1.0076364
5	158	33	28.2	2 6.17	1 37.6	1 47 15.3	3.82	0.9691509	1.0069385	1.0063022
9	158	41	52.8	2 6.14	+1 37.6	+1 47 30.6	+3.81	0.9692030	1.0054278	1.0046152
13	158	50	17.3	2 6.11	1 37.6	1 47 45.8	3.80	0.9692549	1.0037653	1.0028785
17	158	58	41.7	2 6.08	1 37.6	1 48 1.0	3.79	0.9693070	1.0019554	1.0009968
21	159	7	6.1	2 6.05	1 37.6	1 48 16.1	3.78	0.9693592	1.0000031	0.9989753
25	159	15	30.2	2 6.02	1 37.5	1 48 31.2	3.77	0.9694114	0.9979141	0.9968201
29	159	23	54.2	2 5.99	+1 37.5	+1 48 46.3	+3.76	0.9694637	0.9956940	0.9945365
Nov. 2	159	32	18.1	2 5.96	1 37.5	1 49 1.3	3.75	0.9695160	0.9933484	0.9921304
6	159	40	41.9	2 5.93	1 37.5	1 49 16.3	3.74	0.9695684	0.9908832	0.9896076
10	159	49	5.5	2 5.90	1 37.4	1 49 31.2	3.73	0.9696208	0.9883050	0.9869761
14	159	57	29.0	2 5.87	1 37.4	1 49 46.0	3.71	0.9696732	0.9856224	0.9842450
18	160	5	52.5	2 5.84	+1 37.3	+1 50 0.9	+3.70	0.9697256	0.9828454	0.9814247
22	160	14	15.7	2 5.81	1 37.3	1 50 15.7	3.69	0.9697782	0.9799845	0.9785959
26	160	22	39.0	2 5.78	1 37.2	1 50 30.4	3.68	0.9698308	0.9770504	0.9755592
30	160	31	2.1	2 5.75	1 37.2	1 50 45.1	3.67	0.9698834	0.9740537	0.9725353
Dec. 4	160	39	25.0	2 5.72	1 37.1	1 50 59.8	3.66	0.9699361	0.9710056	0.9694663
8	160	47	47.8	2 5.69	+1 37.1	+1 51 14.4	+3.65	0.9699888	0.9679190	0.9663655
12	160	56	10.5	2 5.66	1 37.0	1 51 29.0	3.64	0.9700415	0.9648078	0.9632479
16	161	4	33.0	2 5.63	1 37.0	1 51 43.5	3.63	0.9700943	0.9616877	0.9601292
20	161	12	55.6	2 5.59	1 36.9	1 51 58.0	3.62	0.9701471	0.9585745	0.9570258
24	161	21	17.9	2 5.56	1 36.9	1 52 12.5	3.61	0.9702001	0.9554849	0.9539537
28	161	29	40.1	2 5.53	+1 36.8	+1 52 26.9	+3.60	0.9702531	0.9524343	0.9509286
32	161	38	2.2	2 5.50	+1 36.7	+1 52 41.2	+3.58	0.9703061	0.9494387	

URANUS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan.—2	203 19 56.7	45.90	—9.2	+0 35 37.0	—0.40	1.2655196	1.2721446	1.2706116
+6	203 26 3.9	45.90	9.2	0 35 33.8	0.40	1.2655384	1.2690467	1.2674563
14	203 32 11.1	45.89	9.2	0 35 30.6	0.40	1.2655573	1.2658478	1.2642279
22	203 38 18.2	45.89	9.2	0 35 27.4	0.40	1.2655763	1.2626055	1.2609888
30	203 44 25.3	45.88	9.2	0 35 24.2	0.40	1.2655953	1.2593885	1.2578061
Feb. 7	203 50 32.3	45.88	—9.2	+0 35 21.0	—0.40	1.2656144	1.2562561	1.2547438
15	203 56 39.3	45.87	9.2	0 35 17.8	0.40	1.2656335	1.2532773	1.2518651
23	204 2 46.3	45.87	9.2	0 35 14.6	0.40	1.2656526	1.2505156	1.2492364
Mar. 3	204 8 53.2	45.86	9.2	0 35 11.4	0.40	1.2656718	1.2480347	1.2469167
11	204 15 0.0	45.86	9.2	0 35 8.2	0.40	1.2656911	1.2458885	1.2449560
19	204 21 6.9	45.85	—9.2	+0 35 4.9	—0.40	1.2657104	1.2441253	1.2434006
27	204 27 13.7	45.85	9.2	0 35 1.7	0.41	1.2657298	1.2427875	1.2422888
Apr. 4	204 33 20.4	45.84	9.3	0 34 58.5	0.41	1.2657492	1.2419064	1.2416491
12	204 39 27.1	45.84	9.3	0 34 55.2	0.41	1.2657687	1.2414973	1.2414730
20	204 45 33.8	45.83	9.3	0 34 51.9	0.41	1.2657882	1.2415693	1.2417860
28	204 51 40.4	45.83	—9.3	+0 34 48.7	—0.41	1.2658077	1.2421208	1.2425705
May 6	204 57 47.0	45.82	9.3	0 34 45.4	0.41	1.2658273	1.2431319	1.2438017
14	205 3 53.6	45.82	9.3	0 34 42.1	0.41	1.2658470	1.2445759	1.2454504
22	205 10 0.1	45.81	9.3	0 34 38.8	0.41	1.2658667	1.2464197	1.2474780
30	205 16 6.6	45.81	9.3	0 34 35.6	0.41	1.2658865	1.2486185	1.2498343
June 7	205 22 13.0	45.80	—9.3	+0 34 32.3	—0.41	1.2659063	1.2511193	1.2524671
15	205 28 19.4	45.80	9.3	0 34 28.9	0.41	1.2659262	1.2538707	1.2553233
23	205 34 25.7	45.79	9.3	0 34 25.6	0.41	1.2659461	1.2568160	1.2583422
July 1	205 40 32.0	45.79	9.3	0 34 22.3	0.41	1.2659661	1.2598938	1.2614637
9	205 46 38.3	45.78	9.3	0 34 19.0	0.42	1.2659861	1.2630456	1.2646323
17	205 52 44.5	45.78	—9.3	+0 34 15.6	—0.42	1.2660062	1.2662169	1.2677919
25	205 58 50.7	45.77	9.3	0 34 12.3	0.42	1.2660263	1.2693501	1.2708852
Aug. 2	206 4 56.9	45.77	9.3	0 34 9.0	0.42	1.2660465	1.2723911	1.2738625
10	206 11 3.0	45.76	9.3	0 34 5.6	0.42	1.2660667	1.2752935	1.2766786
18	206 17 9.0	45.76	9.3	0 34 2.3	0.42	1.2660870	1.2780119	1.2792881
26	206 23 15.1	45.75	—9.3	+0 33 58.9	—0.42	1.2661073	1.2805021	1.2816502
Sept. 3	206 29 21.1	45.75	9.3	0 33 55.6	0.42	1.2661277	1.2827284	1.2837330
11	206 35 27.0	45.74	9.3	0 33 52.2	0.42	1.2661481	1.2846601	1.2855056
19	206 41 32.9	45.73	9.3	0 33 48.8	0.42	1.2661686	1.2862665	1.2869397
27	206 47 38.8	45.73	9.4	0 33 45.4	0.42	1.2661892	1.2875232	1.2880154
Oct. 5	206 53 44.6	45.72	—9.4	+0 33 42.1	—0.42	1.2662096	1.2884141	1.2887177
13	206 59 50.3	45.72	9.4	0 33 38.7	0.42	1.2662305	1.2899245	1.2890328
21	207 5 56.1	45.71	9.4	0 33 35.3	0.43	1.2662512	1.2890498	1.2889537
29	207 12 1.8	45.71	9.4	0 33 31.8	0.43	1.2662719	1.2887666	1.2884616
Nov. 6	207 18 7.4	45.70	9.4	0 33 28.4	0.43	1.2662927	1.2880992	1.2876199
14	207 24 13.6	45.70	—9.4	+0 33 25.0	—0.43	1.2663136	1.2870448	1.2863758
22	207 30 18.6	45.69	9.4	0 33 21.6	0.43	1.2663345	1.2856162	1.2847681
30	207 36 24.1	45.69	9.4	0 33 18.1	0.43	1.2663555	1.2838349	1.2828189
Dec. 8	207 42 29.6	45.68	9.4	0 33 14.7	0.43	1.2663766	1.2817239	1.2805537
16	207 48 35.0	45.68	9.4	0 33 11.3	0.43	1.2663976	1.2793130	1.2780071
24	207 54 40.4	45.67	—9.4	+0 33 7.8	—0.43	1.2664188	1.2766418	1.2752224
32	208 0 45.7	45.67	—9.4	+0 33 4.4	—0.43	1.2664400	1.2737543	

NEPTUNE.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. —2	63 21 52.3	22.00	—35.5	—1 38 28.6	+0.28	1.4745950	1.4627448	1.4633842
+6	63 24 48.2	22.00	35.6	1 38 26.5	0.27	1.4745965	1.4640785	1.4648248
14	63 27 44.2	22.00	35.7	1 38 24.4	0.27	1.4745980	1.4656187	1.4664562
22	63 30 40.2	22.00	35.7	1 38 22.3	0.27	1.4745995	1.4673326	1.4682428
30	63 33 36.2	22.00	35.8	1 38 20.1	0.27	1.4746010	1.4691817	1.4701440
Feb. 7	63 36 32.2	22.00	—35.8	—1 38 18.0	+0.27	1.4746025	1.4711260	1.4721200
15	63 39 28.2	22.00	35.9	1 38 15.9	0.27	1.4746041	1.4731240	1.4741320
23	63 42 24.1	22.00	36.0	1 38 13.7	0.27	1.4746056	1.4751369	1.4761391
Mar. 3	63 45 20.1	22.00	36.0	1 38 11.6	0.27	1.4746072	1.4771286	1.4781026
11	63 48 16.1	22.00	36.1	1 38 9.4	0.27	1.4746087	1.4790570	1.4799680
19	63 51 12.1	22.00	—36.1	—1 38 7.2	+0.27	1.4746103	1.4808913	1.4817626
27	63 54 8.1	22.00	36.2	1 38 5.1	0.27	1.4746118	1.4825963	1.4833948
Apr. 4	63 57 4.1	22.00	36.3	1 38 2.9	0.27	1.4746134	1.4841494	1.4848592
12	64 0 0.1	22.00	36.3	1 38 0.7	0.27	1.4746150	1.4855217	1.4861343
20	64 2 56.1	22.00	36.4	1 37 58.6	0.27	1.4746166	1.4866948	1.4872004
28	64 5 52.1	22.00	—36.4	—1 37 56.4	+0.27	1.4746182	1.4876500	1.4880417
May 6	64 8 48.1	22.00	36.5	1 37 54.2	0.27	1.4746198	1.4883748	1.4886481
14	64 11 44.1	22.00	36.6	1 37 52.0	0.27	1.4746214	1.4888608	1.4890119
22	64 14 40.1	22.00	36.6	1 37 49.8	0.27	1.4746230	1.4891011	1.4891277
30	64 17 36.1	22.00	36.7	1 37 47.6	0.27	1.4746246	1.4890925	1.4889960
June 7	64 20 32.1	22.00	—36.7	—1 37 45.4	+0.28	1.4746262	1.4888384	1.4886902
15	64 23 28.1	22.00	36.8	1 37 43.2	0.28	1.4746279	1.4883424	1.4880066
23	64 26 24.1	22.00	36.9	1 37 41.0	0.28	1.4746295	1.4876117	1.4871611
July 1	64 29 20.2	22.00	36.9	1 37 38.8	0.28	1.4746311	1.4866565	1.4861002
9	64 32 16.2	22.00	37.0	1 37 36.6	0.28	1.4746328	1.4854940	1.4848394
17	64 35 12.2	22.00	—37.0	—1 37 34.4	+0.28	1.4746344	1.4841393	1.4833961
25	64 38 8.2	22.00	37.1	1 37 32.1	0.28	1.4746361	1.4826131	1.4817935
Aug. 2	64 41 4.2	22.00	37.1	1 37 29.9	0.28	1.4746378	1.4809405	1.4800573
10	64 44 0.3	22.00	37.2	1 37 27.7	0.28	1.4746394	1.4791474	1.4782141
18	64 46 56.3	22.00	37.2	1 37 25.4	0.28	1.4746411	1.4772619	1.4762948
26	64 49 52.3	22.00	—37.3	—1 37 23.2	+0.28	1.4746428	1.4753172	1.4743336
Sept. 3	64 52 48.4	22.00	37.3	1 37 20.9	0.28	1.4746445	1.4733480	1.4723646
11	64 55 44.4	22.01	37.4	1 37 18.7	0.28	1.4746462	1.4713882	1.4704235
19	64 58 40.4	22.01	37.4	1 37 16.4	0.28	1.4746479	1.4694755	1.4685492
27	65 1 36.5	22.01	37.5	1 37 14.2	0.28	1.4746496	1.4676490	1.4667794
Oct. 5	65 4 32.6	22.01	—37.5	—1 37 11.9	+0.28	1.4746513	1.4659447	1.4651495
13	65 7 28.6	22.01	37.6	1 37 9.6	0.28	1.4746530	1.4643962	1.4636956
21	65 10 24.7	22.01	37.7	1 37 7.3	0.28	1.4746547	1.4630453	1.4624515
29	65 13 20.7	22.01	37.7	1 37 5.1	0.28	1.4746564	1.4619170	1.4614450
Nov. 6	65 16 16.8	22.01	37.8	1 37 2.8	0.29	1.4746581	1.4610383	1.4607001
14	65 19 12.8	22.01	—37.8	—1 37 0.5	+0.29	1.4746599	1.4604321	1.4602369
22	65 22 8.9	22.01	37.9	1 36 58.2	0.29	1.4746616	1.4601149	1.4600673
30	65 25 5.0	22.01	37.9	1 36 55.9	0.29	1.4746633	1.4600940	1.4601955
Dec. 8	65 28 1.0	22.01	38.0	1 36 53.6	0.29	1.4746650	1.4603710	1.4606906
16	65 30 57.1	22.01	38.0	1 36 51.3	0.29	1.4746668	1.4609420	1.4613342
24	65 33 53.2	22.01	—38.1	—1 36 49.0	+0.29	1.4746685	1.4617939	1.4623185
32	65 36 49.3	22.01	—38.1	—1 36 46.7	+0.29	1.4746703	1.4629056	

FOR GREENWICH MEAN NOON AND MIDNIGHT.									
Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Jan. 0	+0.1720565	+0.1806594	+792	-0.8880693	-0.8866261	+144	-0.3852855	-0.3846593	+ 21
1	0.1892477	0.1978212	781	0.8851142	0.8835337	155	0.3840031	0.3833172	27
2	0.2063791	0.2149206	769	0.8818847	0.8801674	166	0.3826014	0.3818562	32
3	0.2234452	0.2319523	758	0.8783819	0.8765284	177	0.3810811	0.3802768	38
4	0.2404411	0.2489113	746	0.8746069	0.8726178	187	0.3794428	0.3785796	43
5	+0.2573619	+0.2657927	+735	-0.8705610	-0.8684369	+197	-0.3776869	-0.3767651	+ 48
6	0.2742028	0.2825918	723	0.8662455	0.8639871	206	0.3758140	0.3748339	53
7	0.2909590	0.2993036	712	0.8616818	0.8592698	215	0.3738248	0.3727868	58
8	0.3076253	0.3159231	700	0.8568112	0.8542861	224	0.3717199	0.3706243	63
9	0.3241968	0.3324455	688	0.8516948	0.8490373	233	0.3694999	0.3683469	68
10	+0.3406690	+0.3488662	+676	-0.8463140	-0.8435249	+241	-0.3671653	-0.3659553	+ 72
11	0.3570369	0.3651901	664	0.8406703	0.8377504	249	0.3647167	0.3634500	77
12	0.3732953	0.3813819	652	0.8347653	0.8317153	256	0.3621548	0.3608317	81
13	0.3894392	0.3974666	640	0.8286004	0.8254211	263	0.3594803	0.3581012	86
14	0.4054636	0.4134293	628	0.8221772	0.8188694	270	0.3566940	0.3552592	90
15	+0.4213633	+0.4292647	+616	-0.8154974	-0.8120619	+277	-0.3537966	-0.3523064	+ 94
16	0.4371331	0.4449677	603	0.8085628	0.8050007	283	0.3507888	0.3492437	98
17	0.4527679	0.4605330	591	0.8013756	0.7976881	289	0.3476714	0.3460719	102
18	0.4682624	0.4759553	578	0.7939382	0.7901264	295	0.3444454	0.3427920	106
19	0.4836113	0.4912295	566	0.7862528	0.7823178	301	0.3411119	0.3394051	110
20	+0.4988095	+0.5063506	+554	-0.7783217	-0.7742648	+306	-0.3376719	-0.3359122	+113
21	0.5138523	0.5213140	542	0.7701475	0.7659701	311	0.3341263	0.3323143	117
22	0.5287350	0.5361148	530	0.7617331	0.7574368	316	0.3304762	0.3286126	120
23	0.5434527	0.5507481	518	0.7530815	0.7486678	321	0.3267231	0.3248085	123
24	0.5580004	0.5652089	506	0.7441957	0.7396661	325	0.3228685	0.3209035	126
25	+0.5723731	+0.5794926	+494	-0.7350790	-0.7304351	+329	-0.3189136	-0.3168989	+129
26	0.5865665	0.5935949	482	0.7257346	0.7209781	332	0.3148596	0.3127960	132
27	0.6005766	0.6075118	470	0.7161658	0.7112983	336	0.3107080	0.3085961	135
28	0.6143994	0.6212393	458	0.7063758	0.7013990	339	0.3064603	0.3043009	137
29	0.6280308	0.6347734	446	0.6963681	0.6912838	342	0.3021181	0.2999120	140
30	+0.6414667	+0.6481101	+434	-0.6861463	-0.6809562	+344	-0.2976829	-0.2954308	+142
31	0.6547033	0.6612459	422	0.6757136	0.6704194	347	0.2931561	0.2908589	144
Feb. 1	0.6677374	0.6741773	411	0.6650735	0.6596769	349	0.2885393	0.2861977	146
2	0.6805653	0.6869007	399	0.6542296	0.6487322	351	0.2838341	0.2814488	148
3	0.6931833	0.6994125	388	0.6431849	0.6375883	352	0.2790419	0.2766136	150
4	+0.7055879	+0.7117092	+376	-0.6319426	-0.6262486	+354	-0.2741641	-0.2716935	+152
5	0.7177758	0.7237875	365	0.6205063	0.6147166	355	0.2692021	0.2666900	154
6	0.7297438	0.7356442	354	0.6088798	0.6029959	356	0.2641575	0.2616046	156
7	0.7414884	0.7472759	343	0.5970857	0.5910897	357	0.2590318	0.2564390	157
8	0.7530061	0.7586780	332	0.5850680	0.5790014	358	0.2538266	0.2511947	158
9	+0.7642936	+0.7698499	+321	-0.5728899	-0.5667344	+359	-0.2485435	-0.2458732	+159
10	0.7753473	0.7807854	310	0.5605350	0.5542925	360	0.2431838	0.2404757	160
11	0.7861639	0.7914823	300	0.5480069	0.5416791	360	0.2377489	0.2350038	161
12	0.7967402	0.8019372	289	0.5353092	0.5288979	360	0.2322405	0.2294593	162
13	0.8070728	0.8121466	279	0.5224456	0.5159528	360	0.2266603	0.2238439	162
14	+0.8171580	+0.8221068	+268	-0.5094202	-0.5028480	+360	-0.2210100	-0.2181501	+163
15	+0.8269923	+0.8318145	+258	-0.4962370	-0.4895875	+359	-0.2152912	-0.2124067	+163

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 15	+0.8269923	+0.8318145	+258	-0.4862370	-0.4895875	+359	-0.2152912	-0.2124067	+163
16	0.8365727	0.8412668	248	0.4829001	0.4761754	358	0.2095058	0.2065887	164
17	0.8458062	0.8504608	238	0.4694139	0.4626161	358	0.2036555	0.2007067	164
18	0.8549599	0.8593934	228	0.4557827	0.4489142	358	0.1977422	0.1947626	164
19	0.8637606	0.8680616	219	0.4420112	0.4350742	357	0.1917679	0.1887585	164
20	+0.8722958	+0.8764630	+209	-0.4281039	-0.4211007	+356	-0.1857346	-0.1826964	+164
21	0.8805620	0.8845950	200	0.4140652	0.4069981	355	0.1796442	0.1765781	164
22	0.8885593	0.8924552	191	0.3998997	0.3927712	354	0.1734985	0.1704057	164
23	0.8962927	0.9000414	182	0.3856127	0.3784251	353	0.1672998	0.1641814	163
24	0.9037311	0.9073517	173	0.3712089	0.3639646	352	0.1610504	0.1579073	163
25	+0.9109029	+0.9143845	+164	-0.3566929	-0.3493943	+350	-0.1547523	-0.1515855	+162
26	0.9177963	0.9211390	155	0.3420693	0.3347187	348	0.1484073	0.1452180	162
27	0.9244095	0.9276105	147	0.3273429	0.3199426	346	0.1420176	0.1388068	161
28	0.9307409	0.9338006	138	0.3125184	0.3050709	344	0.1355854	0.1323540	160
Mar. 1	0.9367893	0.9397071	130	0.2976006	0.2901081	342	0.1291126	0.1258617	159
2	+0.9425537	+0.9453290	+122	-0.2825939	-0.2750586	+340	-0.1226012	-0.1193318	+158
3	0.9480329	0.9506652	114	0.2675026	0.2599267	337	0.1160533	0.1127663	156
4	0.9532256	0.9557142	106	0.2523313	0.2447170	335	0.1094708	0.1061672	155
5	0.9581306	0.9604750	99	0.2370844	0.2294339	332	0.1028556	0.0995363	153
6	0.9627469	0.9649466	91	0.2217662	0.2140818	330	0.0962095	0.0928756	152
7	+0.9670736	+0.9691290	+84	-0.2063812	-0.1986650	+327	-0.0895346	-0.0861870	+150
8	0.9711095	0.9730182	76	0.1909337	0.1831879	324	0.0828328	0.0794725	149
9	0.9748536	0.9766161	69	0.1754281	0.1676550	321	0.0761060	0.0727339	147
10	0.9783051	0.9799208	62	0.1598690	0.1520708	318	0.0693561	0.0659732	145
11	0.9814629	0.9829313	55	0.1442609	0.1364399	315	0.0625850	0.0591922	143
12	+0.9843259	+0.9856466	+48	-0.1286082	-0.1207665	+312	-0.0557946	-0.0523928	+141
13	0.9868931	0.9880656	42	0.1129151	0.1050549	308	0.0489868	0.0455770	139
14	0.9891837	0.9901876	35	0.0971862	0.0893100	305	0.0421635	0.0387468	137
15	0.9911370	0.9920119	29	0.0814267	0.0735370	302	0.0353269	0.0319044	135
16	0.9928122	0.9935378	23	0.0656415	0.0577407	299	0.0284791	0.0250518	133
17	+0.9941887	+0.9947648	+17	-0.0498353	-0.0419259	+295	-0.0216222	-0.0181910	+130
18	0.9952661	0.9956925	11	0.0340131	0.0260976	292	0.0147581	0.0113240	128
19	0.9960440	0.9963206	+6	0.0181799	-0.0102608	288	0.0078889	-0.0044531	125
20	0.9965222	0.9966459	0	-0.0023407	+0.0055795	284	-0.0010169	+0.0024193	123
21	0.9967007	0.9966776	-5	+0.0134995	0.0214182	280	+0.0058554	0.0092909	120
22	+0.9965797	+0.9964070	-10	+0.0293353	+0.0372500	+276	+0.0127257	+0.0161595	+118
23	0.9961596	0.9958376	15	0.0451616	0.0530697	273	0.0195920	0.0230230	115
24	0.9954410	0.9949701	20	0.0609734	0.0688724	268	0.0264524	0.0298796	113
25	0.9944247	0.9938051	24	0.0767660	0.0846536	263	0.0333047	0.0367271	110
26	0.9931114	0.9923436	29	0.0925346	0.1004084	259	0.0401467	0.0435632	108
27	+0.9915020	+0.9905866	-33	+0.1082743	+0.1161318	+255	+0.0469762	+0.0503856	+105
28	0.9895977	0.9885354	37	0.1239802	0.1318190	251	0.0537909	0.0571922	102
29	0.9873999	0.9861912	41	0.1396475	0.1474654	246	0.0605889	0.0639811	99
30	0.9849098	0.9835553	45	0.1552719	0.1630668	241	0.0673683	0.0707504	97
31	0.9821285	0.9806290	48	0.1708494	0.1786192	237	0.0741271	0.0774982	94
32	+0.9790573	+0.9774135	-52	+0.1863756	+0.1941181	+233	+0.0806634	+0.0842226	+91
33	+0.9756977	+0.9739102	-55	+0.2018459	+0.2095589	+228	+0.0875755	+0.0909219	+88

FOR GREENWICH MEAN NOON AND MIDNIGHT.									
Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Apr. 1	+0.9790573	+0.9774135	-52	+0.1863756	+0.1941181	+233	+0.0808634	+0.0842226	+91
2	0.9756977	0.9739102	55	0.2018459	0.2095589	228	0.0875755	0.0909219	88
3	0.9720511	0.9701206	58	0.2172561	0.2249375	223	0.0942614	0.0975940	84
4	0.9681189	0.9660461	61	0.2326022	0.2402499	218	0.1009193	0.1042371	81
5	0.9639025	0.9616882	64	0.2478799	0.2554918	213	0.1075473	0.1108495	78
6	+0.9594033	+0.9570482	-66	+0.2630850	+0.2706592	+209	+0.1141437	+0.1174295	+75
7	0.9546228	0.9521275	68	0.2782136	0.2857479	204	0.1207068	0.1239753	72
8	0.9495624	0.9469276	70	0.2932614	0.3007538	198	0.1272348	0.1304851	69
9	0.9442233	0.9414497	72	0.3082244	0.3156728	192	0.1337259	0.1369570	66
10	0.9386069	0.9356953	74	0.3230983	0.3305005	187	0.1401782	0.1433893	63
11	+0.9327148	+0.9296659	-76	+0.3378788	+0.3452327	+181	+0.1465900	+0.1497802	+60
12	0.9265486	0.9233633	77	0.3525615	0.3598649	176	0.1529595	0.1561278	57
13	0.9201101	0.9167893	78	0.3671422	0.3743929	170	0.1592849	0.1624303	54
14	0.9134011	0.9099458	79	0.3816163	0.3888121	165	0.1655641	0.1686858	51
15	0.9064236	0.9028348	80	0.3959794	0.4031181	159	0.1717952	0.1748923	48
16	+0.8991796	+0.8954584	-80	+0.4102273	+0.4173068	+154	+0.1779764	+0.1810479	+45
17	0.8916713	0.8878187	80	0.4243558	0.4313739	148	0.1841060	0.1871508	42
18	0.8839009	0.8799182	80	0.4383605	0.4453150	143	0.1901821	0.1931994	40
19	0.8756709	0.8717594	80	0.4522368	0.4591256	137	0.1962026	0.1991915	37
20	0.8675841	0.8633453	79	0.4659804	0.4728013	132	0.2021657	0.2051252	34
21	+0.8590434	+0.8546788	-78	+0.4795873	+0.4863382	+127	+0.2080896	+0.2109988	+31
22	0.8502519	0.8457630	77	0.4930535	0.4997325	122	0.2139125	0.2168105	28
23	0.8412125	0.8366008	76	0.5063749	0.5129801	116	0.2196927	0.2225590	25
24	0.8319283	0.8271955	74	0.5195477	0.5260772	111	0.2254089	0.2282419	22
25	0.8224027	0.8175505	73	0.5325680	0.5390199	105	0.2310580	0.2338573	19
26	+0.8126390	+0.8076690	-71	+0.5454322	+0.5518048	+100	+0.2366398	+0.2394050	+17
27	0.8026405	0.7975543	69	0.5581372	0.5644290	94	0.2421524	0.2448822	14
28	0.7924105	0.7872098	67	0.5706798	0.5768891	89	0.2475943	0.2502886	11
29	0.7819525	0.7766391	65	0.5830565	0.5891816	83	0.2529646	0.2556210	8
30	0.7712699	0.7658454	62	0.5952641	0.6013035	77	0.2582606	0.2608807	5
May 1	+0.7603659	+0.7548320	-59	+0.6072995	+0.6132517	+ 71	+0.2634821	+0.2660645	+ 3
2	0.7492439	0.7436022	56	0.6191596	0.6250231	66	0.2686274	0.2711719	0
3	0.7379072	0.7321594	53	0.6308415	0.6366148	61	0.2736952	0.2761996	- 2
4	0.7263591	0.7205068	49	0.6423423	0.6480240	56	0.2786844	0.2811493	5
5	0.7146029	0.7086478	45	0.6536593	0.6592479	51	0.2835040	0.2860182	7
6	+0.7026418	+0.6965855	-41	+0.6647895	+0.6702836	+ 46	+0.2884219	+0.2908053	- 9
7	0.6904792	0.6843233	37	0.6757299	0.6811280	41	0.2931677	0.2955094	11
8	0.6781182	0.6718643	33	0.6864774	0.6917779	37	0.2978297	0.3001291	14
9	0.6655620	0.6592118	27	0.6970290	0.7022305	32	0.3024067	0.3046629	16
10	0.6528139	0.6463892	22	0.7073819	0.7124829	28	0.3068976	0.3091106	18
11	+0.6398777	+0.6333403	-17	+0.7175331	+0.7225321	+ 23	+0.3113015	+0.3134700	-20
12	0.6267570	0.6201287	12	0.7274796	0.7323751	19	0.3156161	0.3177398	22
13	0.6134556	0.6067380	7	0.7372182	0.7420086	15	0.3198410	0.3219195	24
14	0.5999764	0.5931719	- 1	0.7467460	0.7514299	11	0.3239748	0.3260089	26
15	0.5863241	0.5794340	+ 6	0.7560600	0.7606360	7	0.3280154	0.3300006	28
16	+0.5725022	+0.5655292	+12	+0.7651574	+0.7696241	+ 3	+0.3319625	+0.3339007	-29
17	+0.5585151	+0.5514610	+19	+0.7740355	+0.7783915	0	+0.3358149	+0.3377049	-31

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.5585151	+0.5514610	+ 19	+0.7740355	+0.7783915	0	+0.3358146	+0.3377049	-31
18	0.5443672	0.5372343	26	0.7826917	0.7869357	- 4	0.3395706	0.3414123	32
19	0.5300630	0.5228536	33	0.7911231	0.7952537	7	0.3432292	0.3450217	34
20	0.5156070	0.5083234	40	0.7993273	0.8033434	11	0.3467893	0.3485321	35
21	0.5010036	0.4936480	47	0.8073020	0.8112026	15	0.3502498	0.3519424	36
22	+0.4862573	+0.4788320	+ 55	+0.8150451	+0.818 293	-18	+0.3536097	+0.3552517	-37
23	0.4713727	0.4636801	62	0.8225548	0.8262215	21	0.3568623	0.3584593	38
24	0.4563547	0.4487971	70	0.8298291	0.8333774	23	0.3600247	0.3615643	38
25	0.4412080	0.4335876	78	0.8368660	0.8402950	25	0.3630781	0.3645659	39
26	0.4259368	0.4182559	86	0.8436839	0.8469728	26	0.3660277	0.3674633	40
27	+0.4105456	+0.4028065	+ 94	+0.8502214	+0.8534095	-28	+0.3688728	+0.3702560	-41
28	0.3950393	0.3872444	103	0.8565370	0.8596037	29	0.3716129	0.3729433	41
29	0.3794226	0.3715742	111	0.8626095	0.8655542	30	0.3742472	0.3755246	42
30	0.3637000	0.3558002	120	0.8684376	0.8712597	31	0.3767753	0.3779994	42
31	0.3478755	0.3399263	128	0.8740201	0.8767189	32	0.3791968	0.3803674	43
June 1	+0.3319532	+0.3239569	+137	+0.8793558	+0.8819307	-33	+0.3815112	+0.3826280	-43
2	0.3159379	0.3078968	146	0.8844434	0.8868939	33	0.3837179	0.3847806	44
3	0.2998341	0.2917502	155	0.8892818	0.8916072	33	0.3858163	0.3868248	44
4	0.2836457	0.2755210	164	0.8938698	0.8960695	33	0.3878061	0.3887601	44
5	0.2673767	0.2592133	173	0.8982062	0.9002797	32	0.3896868	0.3905861	44
6	+0.2510314	+0.2428316	+182	+0.9022898	+0.9042365	-32	+0.3914579	+0.3923022	-44
7	0.2346144	0.2263803	191	0.9061195	0.9079388	31	0.3931188	0.3939078	44
8	0.2181300	0.2098638	200	0.9096940	0.9113859	30	0.3946691	0.3954026	44
9	0.2015826	0.1932866	210	0.9130120	0.9145745	28	0.3961083	0.3967861	43
10	0.1849766	0.1766531	219	0.9160724	0.9175057	27	0.3974360	0.3980579	42
11	+0.1683166	+0.1599679	+229	+0.9188742	+0.9201778	-25	+0.3986517	+0.3992174	-41
12	0.1516075	0.1432361	238	0.9214163	0.9225897	23	0.3997548	0.4002640	40
13	0.1348542	0.1264625	248	0.9236977	0.9247403	20	0.4007449	0.4011974	39
14	0.1180616	0.1096521	257	0.9257174	0.9266289	17	0.4016216	0.4020173	38
15	0.1012345	0.0928096	267	0.9274747	0.9282548	14	0.4023846	0.4027233	37
16	+0.0843779	+0.0759402	+276	+0.9289690	+0.9296174	-11	+0.4030336	+0.4033152	-36
17	0.0674968	0.0590468	285	0.9301998	0.9307163	7	0.4035683	0.4037927	34
18	0.0505964	0.0421407	294	0.9311689	0.9315514	- 3	0.4039885	0.4041556	33
19	0.0336820	0.0252212	304	0.9318699	0.9321224	+ 2	0.4042941	0.4044039	31
20	+0.0167588	+0.0082955	313	0.9323088	0.9324293	8	0.4044851	0.4045376	30
21	-0.0001682	-0.0086315	+322	+0.9324837	+0.9324722	+12	+0.4045615	+0.4045568	-28
22	0.0170941	0.0255550	331	0.9323948	0.9322516	18	0.4045234	0.4044615	27
23	0.0340139	0.0424699	340	0.9320425	0.9317678	23	0.4043709	0.4042518	25
24	0.0509226	0.0593712	349	0.9314273	0.9310214	29	0.4041041	0.4039280	23
25	0.0678153	0.0762541	357	0.9305498	0.9300120	35	0.4037233	0.4034903	21
26	-0.0846372	-0.0931139	+365	+0.9294105	+0.9287429	+41	+0.4032287	+0.4029389	-19
27	0.1015339	0.1099463	373	0.9280099	0.9272119	48	0.4026206	0.4022742	16
28	0.1183508	0.1267466	381	0.9263487	0.9254208	55	0.4018904	0.4014966	13
29	0.1351332	0.1435101	389	0.9244278	0.9233704	62	0.4010655	0.4006065	10
30	0.1518766	0.1602324	397	0.9222481	0.9210616	70	0.4001193	0.3996043	8
31	-0.1685768	-0.1769095	+404	+0.9198105	+0.9184952	+77	+0.3990612	+0.3984903	- 5
32	-0.1852298	-0.1935371	+412	+0.9171155	+0.9156716	+85	+0.3978913	+0.3972646	- 2

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	
July	1	-0.1685768	-0.1769095	+404	+0.9198105	+0.9184952	+ 77	+0.3990612	+0.3984903	- 5
	2	0.1852298	0.1935371	412	0.9171155	0.9156716	85	0.3978913	0.3972646	- 2
	3	0.2018309	0.2101107	419	0.9141636	0.9125914	93	0.3966100	0.3959276	+ 1
	4	0.2183758	0.2266259	426	0.9109554	0.9092555	101	0.3952176	0.3944799	4
	5	0.2348602	0.2430784	433	0.9074919	0.9056648	110	0.3937146	0.3929218	7
	6	-0.2512797	-0.2594638	+440	+0.9037741	+0.9018201	+119	+0.3921014	+0.3912536	+ 10
	7	0.2676299	0.2757777	446	0.8998027	0.8977219	128	0.3903783	0.3894756	14
	8	0.2839063	0.2920155	453	0.8955780	0.8933709	137	0.3885455	0.3875881	17
	9	0.3001044	0.3081727	459	0.8911008	0.8887678	147	0.3866034	0.3855915	20
	10	0.3162196	0.3242447	465	0.8863722	0.8839138	156	0.3845523	0.3834861	23
	11	-0.3322473	-0.3402269	+470	+0.8813932	+0.8788101	+166	+0.3823927	+0.3812724	+ 27
	12	0.3481827	0.3561143	475	0.8761650	0.8734578	176	0.3801250	0.3789509	30
	13	0.3640208	0.3719019	480	0.8706887	0.8678580	186	0.3777498	0.3765221	34
	14	0.3797568	0.3875850	485	0.8649656	0.8620120	196	0.3752676	0.3739867	38
	15	0.3953860	0.4031590	489	0.8589972	0.8559216	207	0.3726791	0.3713452	42
	16	-0.4109036	-0.4186191	+493	+0.8527853	+0.8495887	+218	+0.3699848	+0.3685982	+ 46
	17	0.4263050	0.4339607	497	0.8463318	0.8430151	229	0.3671855	0.3657467	50
	18	0.4415856	0.4491792	500	0.8396385	0.8362026	240	0.3642821	0.3627916	54
	19	0.4567407	0.4642698	503	0.8327073	0.8291533	251	0.3612755	0.3597337	58
	20	0.4717656	0.4792279	506	0.8255404	0.8218693	262	0.3581664	0.3565737	62
	21	-0.4866557	-0.4940490	+508	+0.8181400	+0.8143529	+273	+0.3549558	+0.3533127	+ 67
	22	0.5014068	0.5087291	510	0.8105084	0.8066067	284	0.3516448	0.3499519	71
	23	0.5160151	0.5232643	512	0.8026481	0.7986330	296	0.3482345	0.3464924	76
	24	0.5304763	0.5376503	514	0.7945617	0.7904345	308	0.3447259	0.3429351	80
	25	0.5447861	0.5518831	515	0.7862518	0.7820137	320	0.3411202	0.3392813	85
	26	-0.5589407	-0.5659587	+516	+0.7777208	+0.7733731	+332	+0.3374185	+0.3355320	+ 89
	27	0.5720364	0.5796736	517	0.7689711	0.7645151	344	0.3336218	0.3316883	94
	28	0.5867698	0.5936244	517	0.7600054	0.7554424	356	0.3297314	0.3277514	99
	29	0.6004371	0.6072073	517	0.7508264	0.7461577	368	0.3257485	0.3237226	104
	30	0.6139346	0.6206186	516	0.7414366	0.7366634	380	0.3216741	0.3196029	109
	Aug.	31	-0.6272588	-0.6338549	+515	+0.7318383	+0.7269617	+392	+0.3175093	+0.3153933
1		0.6404063	0.6469127	514	0.7220339	0.7170552	404	0.3132552	0.3110950	119
2		0.6533736	0.6597886	512	0.7120259	0.7069464	416	0.3089130	0.3067092	124
3		0.6661572	0.6724790	510	0.7018170	0.6966380	428	0.3044838	0.3022369	129
4		0.6787534	0.6849802	508	0.6914097	0.6861324	441	0.2999686	0.2976791	134
5		-0.6911587	-0.6972887	+506	+0.6808064	+0.6754320	+453	+0.2953685	+0.2930370	+139
6		0.7033696	0.7094010	503	0.6700095	0.6645393	465	0.2906846	0.2883116	144
7		0.7153824	0.7213133	500	0.6590217	0.6534571	477	0.2859181	0.2835042	149
8		0.7271933	0.7330219	496	0.6478459	0.6421884	489	0.2810701	0.2786159	154
9		0.7387987	0.7445231	492	0.6364851	0.6307362	501	0.2761419	0.2736480	159
10		-0.7501948	-0.7558131	+488	+0.6249422	+0.6191033	+513	+0.2711347	+0.2686018	+165
11		0.7613778	0.7668892	483	0.6132200	0.6072927	525	0.2660496	0.2634784	170
12		0.7723442	0.7777450	478	0.6013217	0.5953077	537	0.2608881	0.2582793	176
13		0.7830904	0.7883798	473	0.5892508	0.5831518	549	0.2556518	0.2530060	181
14		0.7936128	0.7987891	467	0.5770108	0.5708285	560	0.2503421	0.2476601	187
15		-0.8039081	-0.8089696	+461	+0.5646052	+0.5583414	+572	+0.2449603	+0.2422429	+192
16	-0.8139730	-0.8189180	+454	+0.5520375	+0.5456942	+583	+0.2395080	+0.2367560	+198	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Aug. 16	-0.8139730	-0.8189180	+454	+0.5520375	+0.5456942	+583	+0.2395080	+0.2367560	+198
17	0.8238042	0.8286312	447	0.5393116	0.5328907	595	0.2339669	0.2312012	204
18	0.8333985	0.8381060	440	0.5264315	0.5199350	606	0.2283988	0.2255802	209
19	0.8427530	0.8473396	433	0.5134013	0.5068312	618	0.2227453	0.2198947	214
20	0.8518651	0.8563294	425	0.5002249	0.4935831	629	0.2170283	0.2141465	219
21	-0.8607321	-0.8650729	+417	+0.4869061	+0.4801945	+640	+0.2112494	+0.2083373	+225
22	0.8693515	0.8735677	408	0.4734487	0.4666693	650	0.2054103	0.2024688	231
23	0.8777212	0.8818116	399	0.4598568	0.4530117	661	0.1995127	0.1965427	236
24	0.8858398	0.8898022	391	0.4461345	0.4392258	671	0.1935586	0.1905610	242
25	0.8937019	0.8975374	381	0.4322859	0.4253155	681	0.1875497	0.1845253	247
26	-0.9013084	-0.9050151	+371	+0.4183149	+0.4112847	+691	+0.1814876	+0.1784372	+253
27	0.9086566	0.9122334	361	0.4042252	0.3971370	701	0.1753740	0.1722985	258
28	0.9157446	0.9191905	351	0.3900204	0.3828761	710	0.1692107	0.1661109	263
29	0.9225705	0.9258846	340	0.3757044	0.3685060	719	0.1629994	0.1598762	269
30	0.9291324	0.9323137	329	0.3612812	0.3540306	728	0.1567416	0.1535950	274
31	-0.9354282	-0.9384757	+318	+0.3467546	+0.3394538	+737	+0.1504391	+0.1472717	+279
Sept. 1	0.9414560	0.9443688	306	0.3321285	0.3247793	746	0.1440936	0.1409052	284
2	0.9472140	0.9499911	294	0.3174065	0.3100108	755	0.1377066	0.1344981	290
3	0.9527002	0.9553407	282	0.3025924	0.2951520	763	0.1312797	0.1280519	295
4	0.9579126	0.9604156	270	0.2876900	0.2802069	771	0.1248147	0.1215685	300
5	-0.9628494	-0.9652139	+258	+0.2727033	+0.2651796	+779	+0.1183133	+0.1150495	+305
6	0.9675087	0.9697336	245	0.2576365	0.2500744	787	0.1117771	0.1084966	310
7	0.9718884	0.9739729	232	0.2424939	0.2348955	794	0.1052080	0.1019118	315
8	0.9759868	0.9779300	219	0.2272798	0.2196473	801	0.0986079	0.0952969	320
9	0.9798022	0.9816033	205	0.2119985	0.2043340	808	0.0919786	0.0886536	324
10	-0.9833329	-0.9849911	+191	+0.1966542	+0.1889598	+815	+0.0853219	+0.0819839	+329
11	0.9865773	0.9880917	177	0.1812514	0.1735295	821	0.0786397	0.0752897	333
12	0.9895338	0.9909037	163	0.1657948	0.1580479	827	0.0719340	0.0685731	338
13	0.9923010	0.9934258	149	0.1502894	0.1425199	833	0.0652070	0.0618362	342
14	0.9945778	0.9956571	134	0.1347399	0.1269501	839	0.0584607	0.0550810	347
15	-0.9966634	-0.9975968	+119	+0.1191510	+0.1113434	+844	+0.0516971	+0.0483096	+351
16	0.9984570	0.9992440	104	0.1035277	0.0957047	849	0.0449183	0.0415241	356
17	0.9999578	1.0005982	89	0.0878748	0.0800388	854	0.0381266	0.0347267	360
18	1.0011654	1.0016500	74	0.0721971	0.0643505	859	0.0313241	0.0279195	365
19	1.0020794	1.0024262	58	0.0564993	0.0486445	863	0.0245128	0.0211046	369
20	-1.0026996	-1.0028995	+ 42	+0.0407863	+0.0329257	+867	+0.0176949	+0.0142841	+373
21	1.0030259	1.0030788	26	0.0250630	0.0171989	871	0.0108724	0.0074602	377
22	1.0030582	1.0029641	+ 10	+0.0093339	+0.0014685	874	+0.0040475	+0.0006347	381
23	1.0027966	1.0025557	- 7	-0.0063966	-0.0142610	877	-0.0027779	-0.0061901	385
24	1.0022414	1.0018539	23	0.0221240	0.0299851	880	0.0096019	0.0130127	389
25	-1.0013920	-1.0008589	- 40	-0.0378437	-0.0456993	+883	-0.0164225	-0.0198309	+392
26	1.0002515	0.9995712	57	0.0535514	0.0613993	885	0.0232377	0.0266427	396
27	0.9988176	0.9979910	74	0.0692427	0.0770807	887	0.0300456	0.0334462	399
28	0.9970914	0.9961186	91	0.0849131	0.0927392	889	0.0368443	0.0402396	402
29	0.9950729	0.9939540	108	0.1005584	0.1083704	891	0.0436319	0.0470210	405
30	-0.9927622	-0.9914974	-125	-0.1161744	-0.1239701	+893	-0.0504066	-0.0537886	+408
31	-0.9901596	-0.9887491	-143	-0.1317567	-0.1395340	+894	-0.0571667	-0.0605407	+410

FOR GREENWICH MEAN NOON AND MIDNIGHT.										
Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.		
Oct.	1	-0.9901596	-0.9887491	- 143	-0.1317567	-0.1395340	+894	-0.0671667	-0.0605407	+410
	2	0.9872658	0.9857098	160	0.1473012	0.1550579	896	0.0639103	0.0672753	413
	3	0.9840813	0.9823800	178	0.1628035	0.1705373	896	0.0706354	0.0739904	415
	4	0.9806063	0.9787600	196	0.1782589	0.1859676	897	0.0773402	0.0806843	418
	5	0.9768411	0.9748500	214	0.1936628	0.2013442	896	0.0840227	0.0873550	420
	6	-0.9727862	-0.9706504	- 232	-0.2090109	-0.2166626	+896	-0.0906810	-0.0940005	+422
	7	0.9684422	0.9661620	250	0.2242986	0.2319183	895	0.0973132	0.1006188	424
	8	0.9638098	0.9613857	268	0.2395211	0.2471064	894	0.1039172	0.1072079	426
	9	0.9588898	0.9563223	287	0.2546734	0.2622217	893	0.1104909	0.1137656	428
	10	0.9536833	0.9509729	305	0.2697505	0.2772594	892	0.1170321	0.1202899	430
	11	-0.9481913	-0.9453386	- 324	-0.2847477	-0.2922149	+891	-0.1235388	-0.1267786	+431
	12	0.9424150	0.9394207	342	0.2996603	0.3070834	889	0.1300090	0.1332297	432
	13	0.9363560	0.9332210	361	0.3144835	0.3218600	887	0.1364405	0.1396410	433
	14	0.9300160	0.9267412	380	0.3292123	0.3365398	885	0.1428311	0.1460104	434
	15	0.9233967	0.9199830	399	0.3438418	0.3511179	882	0.1491789	0.1523360	434
	16	-0.9165001	-0.9129425	- 418	-0.3583674	-0.3655899	+879	-0.1554817	-0.1586156	+435
	17	0.9093283	0.9056400	437	0.3727846	0.3799512	875	0.1617374	0.1648470	436
	18	0.9018837	0.8980598	456	0.3870889	0.3941973	872	0.1679441	0.1710284	437
	19	0.8941686	0.8902102	475	0.4012757	0.4083237	868	0.1740999	0.1771580	437
	20	0.8861852	0.8820937	494	0.4153406	0.4223261	864	0.1802027	0.1832337	437
	21	-0.8779361	-0.8737127	- 513	-0.4292795	-0.4362005	+859	-0.1862507	-0.1892537	+437
	22	0.8694239	0.8650700	532	0.4430884	0.4499428	855	0.1922422	0.1952162	437
	23	0.8606515	0.8561686	552	0.4567629	0.4635486	850	0.1981763	0.2011194	436
	24	0.8516218	0.8470112	571	0.4702991	0.4770141	845	0.2040482	0.2069616	435
	25	0.8423372	0.8376001	591	0.4836931	0.4903355	839	0.2098592	0.2127410	434
	26	-0.8328001	-0.8279377	- 610	-0.4969411	-0.5035091	+834	-0.2156067	-0.2184661	+433
	27	0.8230131	0.8180268	630	0.5100393	0.5165310	828	0.2212891	0.2241053	432
	28	0.8129790	0.8078703	649	0.5229838	0.5293974	822	0.2269047	0.2296870	431
	29	0.8027008	0.7974709	669	0.5357712	0.5421049	815	0.2324520	0.2351996	430
	30	0.7921811	0.7868312	688	0.5483979	0.5546498	808	0.2379295	0.2406416	429
Nov.	31	-0.7814220	-0.7759536	- 708	-0.5608601	-0.5670282	+801	-0.2433356	-0.2460114	+427
	1	0.7704263	0.7648408	727	0.5731538	0.5792362	793	0.2466687	0.2513073	425
	2	0.7591970	0.7534959	747	0.5852751	0.5912698	785	0.2539270	0.2565276	423
	3	0.7477372	0.7419219	766	0.5972201	0.6031253	777	0.2591068	0.2616706	421
	4	0.7360499	0.7301218	786	0.6089851	0.6147989	769	0.2642126	0.2667348	418
	5	-0.7241379	-0.7180986	- 805	-0.6205662	-0.6262866	+760	-0.2692369	-0.2717186	+415
	6	0.7120042	0.7058554	825	0.6319595	0.6375845	751	0.2741798	0.2766303	412
	7	0.6996521	0.6933955	844	0.6431611	0.6486887	742	0.2790396	0.2814380	409
	8	0.6870852	0.6807226	864	0.6541671	0.6595954	732	0.2838147	0.2861700	405
	9	0.6743074	0.6678408	883	0.6649735	0.6703007	722	0.2885033	0.2908148	402
	10	-0.6613227	-0.6547539	- 902	-0.6755766	-0.6808009	+711	-0.2931039	-0.2953708	+398
	11	0.6481347	0.6414656	921	0.6859729	0.6910924	701	0.2976150	0.2998365	396
	12	0.6347472	0.6279800	941	0.6961589	0.7011719	689	0.3020349	0.3042102	391
	13	0.6211645	0.6143014	960	0.7061310	0.7110358	677	0.3063690	0.3084903	387
	14	0.6073912	0.6004345	979	0.7158857	0.7206806	665	0.3105947	0.3126753	383
	15	-0.5934318	-0.5863837	- 998	-0.7254198	-0.7301032	+653	-0.3147317	-0.3167639	+379
	16	-0.5792908	-0.5721536	-1017	-0.7347302	-0.7393007	+640	-0.3187716	-0.3207548	+374

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Nov. 16	-0.5792908	-0.5721536	-1017	-0.7347302	-0.7393007	+640	-0.3187718	-0.3207548	+374
17	0.5649728	0.5577487	1036	0.7438141	0.7482703	627	0.3227132	0.3246467	369
18	0.5504822	0.5431736	1054	0.7526687	0.7570092	613	0.3265552	0.3284385	363
19	0.5358236	0.5284328	1073	0.7612912	0.7655147	599	0.3302964	0.3321289	358
20	0.5210017	0.5135312	1091	0.7696791	0.7737844	585	0.3339357	0.3357169	352
21	-0.5060216	-0.4984737	-1109	-0.7778300	-0.7618160	+571	-0.3374720	-0.3392013	+346
22	0.4908879	0.4832648	1127	0.7857417	0.7898071	556	0.3409043	0.3425812	340
23	0.4756049	0.4679088	1145	0.7934119	0.7971557	541	0.3442317	0.3458557	334
24	0.4601769	0.4524100	1162	0.8008384	0.8044596	526	0.3474532	0.3490240	328
25	0.4446085	0.4367731	1180	0.8080191	0.8115166	510	0.3505680	0.3520851	322
26	-0.4289042	-0.4210026	-1197	-0.8149519	-0.8183246	+494	-0.3535752	-0.3550382	+315
27	0.4130686	0.4051030	1215	0.8216347	0.8248816	477	0.3564739	0.3578824	309
28	0.3971062	0.3890788	1232	0.8280655	0.8311857	460	0.3592632	0.3606167	302
29	0.3810214	0.3729345	1249	0.8342423	0.8372348	443	0.3619423	0.3632404	295
30	0.3648187	0.3566746	1265	0.8401631	0.8430268	425	0.3645104	0.3657526	288
Dec. 1	-0.3485028	-0.3403038	-1281	-0.8458257	-0.8485595	+407	-0.3669666	-0.3681525	+281
2	0.3320783	0.3238269	1297	0.8512280	0.8538309	388	0.3693100	0.3704392	273
3	0.3155501	0.3072486	1313	0.8563680	0.8588390	369	0.3715398	0.3726118	266
4	0.2989228	0.2905735	1329	0.8612438	0.8635921	350	0.3736551	0.3746696	258
5	0.2822012	0.2738067	1344	0.8658537	0.8680583	331	0.3756552	0.3766117	250
6	-0.2653906	-0.2569535	-1359	-0.8701957	-0.8722656	+311	-0.3775392	-0.3784373	+242
7	0.2484261	0.2400191	1374	0.8742678	0.8762022	291	0.3793062	0.3801456	234
8	0.2315230	0.2230088	1388	0.8780684	0.8798665	270	0.3809556	0.3817360	225
9	0.2144767	0.2059280	1402	0.8815961	0.8832571	249	0.3824868	0.3832078	216
10	0.1973829	0.1887825	1416	0.8848493	0.8863725	227	0.3838989	0.3845601	207
11	-0.1801872	-0.1715780	-1429	-0.8878266	-0.8892114	+205	-0.3851913	-0.3857924	+198
12	0.1629553	0.1543201	1442	0.8905268	0.8917728	182	0.3863635	0.3869044	188
13	0.1456728	0.1370144	1455	0.8929493	0.8940561	160	0.3874151	0.3878956	179
14	0.1283454	0.1196667	1467	0.8950933	0.8960606	137	0.3883458	0.3887657	169
15	0.1109788	0.1022827	1479	0.8969581	0.8977856	114	0.3891554	0.3895145	160
16	-0.0935788	-0.0848681	-1490	-0.8985432	-0.8992307	+ 90	-0.3898434	-0.3901418	+150
17	0.0761509	0.0674284	1501	0.8998482	0.9003957	67	0.3904097	0.3906473	140
18	0.0587008	0.0499693	1512	0.9008730	0.9012803	43	0.3908543	0.3910310	130
19	0.0412342	0.0324964	1522	0.9016175	0.9018846	+ 18	0.3911772	0.3912930	120
20	0.0237564	-0.0150150	1532	0.9020817	0.9022086	- 7	0.3913784	0.3914333	109
21	-0.0062727	+0.0024695	-1541	-0.9022056	-0.9022526	- 32	-0.3914578	-0.3914519	+ 99
22	+0.0112114	0.0199517	1550	0.9021697	0.9020170	57	0.3914156	0.3913490	88
23	0.0286905	0.0374265	1558	0.9017943	0.9015019	83	0.3912520	0.3911248	77
24	0.0461596	0.0548890	1566	0.9011396	0.9007076	109	0.3909673	0.3907796	66
25	0.0636141	0.0723342	1573	0.9002058	0.8996343	135	0.3905615	0.3903134	55
26	+0.0810488	+0.0897569	-1580	-0.8989931	-0.8982824	-162	-0.3900348	-0.3897264	+ 44
27	0.0984582	0.1071518	1586	0.8975021	0.8966525	189	0.3893875	0.3890187	34
28	0.1158372	0.1245137	1591	0.8957333	0.8947449	216	0.3886196	0.3881905	23
29	0.1331809	0.1418379	1596	0.8936870	0.8925599	243	0.3877313	0.3872421	+ 12
30	0.1504844	0.1591195	1601	0.8913634	0.8900977	270	0.3867228	0.3861736	- 1
31	+0.1677426	+0.1763531	-1605	-0.8887628	-0.8873589	-298	-0.3855944	-0.3849654	- 14
32	+0.1849500	+0.1935332	-1608	-0.8858859	-0.8843442	-326	-0.3843464	-0.3836776	- 26

FOR GREENWICH MEAN NOON AND MIDNIGHT.								
Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	49° 23' 18.5	−3° 39' 48.7	1.0	94° 12' 5.7	+0° 8' 54.3	1.0	102° 38' 50.8	+1° 4' 8.0
1.5	55 29 12.3	3 14 9.0	1.5	100 5 23.5	0 40 51.7	1.5	108 32 5.1	1 34 21.0
2.0	61 32 23.3	2 46 29.7	2.0	105 58 43.4	1 12 20.5	2.0	114 26 44.5	2 3 33.2
2.5	67 33 15.4	2 17 9.9	2.5	111 52 28.2	1 43 2.4	2.5	120 20 19.8	2 31 27.7
3.0	73 32 11.2	1 46 29.1	3.0	117 46 58.1	2 12 39.1	3.0	126 16 18.6	2 57 47.6
3.5	79 29 32.0	−1 14 47.0	3.5	123 42 30.6	+2 40 52.2	3.5	132 14 5.1	+3 22 16.1
4.0	85 25 37.5	0 42 23.4	4.0	129 39 21.2	3 7 23.9	4.0	138 14 0.0	3 44 36.7
4.5	91 20 46.1	−0 9 38.2	4.5	135 37 43.3	3 31 56.6	4.5	144 16 20.4	4 4 32.9
5.0	97 15 15.1	+0 23 8.9	5.0	141 37 48.8	3 54 13.5	5.0	150 21 19.6	4 21 49.3
5.5	103 9 21.0	0 55 37.9	5.5	147 39 47.9	4 13 58.6	5.5	156 29 7.7	4 36 10.9
6.0	109 3 19.5	+1 27 29.3	6.0	153 43 49.7	+4 30 56.9	6.0	162 39 51.3	+4 47 23.9
6.5	114 57 26.0	1 58 23.9	6.5	159 50 3.1	4 44 54.7	6.5	168 53 34.2	4 55 16.3
7.0	120 51 55.7	2 28 3.0	7.0	165 58 36.5	4 55 39.7	7.0	175 10 17.7	4 59 37.8
7.5	126 47 4.1	2 56 8.6	7.5	172 9 38.5	5 3 1.3	7.5	181 30 0.8	5 0 20.2
8.0	132 43 7.0	3 22 23.1	8.0	178 23 18.4	5 6 50.6	8.0	187 52 41.4	4 57 18.1
8.5	138 40 20.9	+3 46 29.9	8.5	184 39 46.2	+5 7 0.5	8.5	194 18 16.5	+4 50 28.4
9.0	144 39 3.4	4 8 13.4	9.0	190 59 13.4	5 3 26.0	9.0	200 46 43.0	4 39 51.5
9.5	150 39 33.3	4 27 18.6	9.5	197 21 52.5	4 56 4.4	9.5	207 17 58.3	4 25 30.7
10.0	156 42 10.3	4 43 31.6	10.0	203 47 57.4	4 44 55.0	10.0	213 52 0.9	4 7 32.4
10.5	162 47 15.9	4 56 39.5	10.5	210 17 43.5	4 29 59.7	10.5	220 28 50.6	3 46 6.2
11.0	168 55 12.9	+5 6 30.5	11.0	216 51 26.6	+4 11 23.0	11.0	227 8 28.9	+3 21 25.1
11.5	175 6 25.2	5 12 53.4	11.5	223 29 23.0	3 49 12.3	11.5	233 50 59.1	2 53 45.4
12.0	181 21 17.9	5 15 38.7	12.0	230 11 48.7	3 23 38.2	12.0	240 36 25.8	2 23 26.2
12.5	187 40 16.3	5 14 37.9	12.5	236 58 58.9	2 54 54.5	12.5	247 24 54.9	1 50 49.5
13.0	194 3 46.5	5 9 43.9	13.0	243 51 6.4	2 23 19.1	13.0	254 16 32.8	1 16 20.9
13.5	200 32 13.7	+5 0 51.4	13.5	250 48 20.5	+1 49 13.5	13.5	261 11 25.4	+0 40 28.1
14.0	207 6 2.0	4 47 57.4	14.0	257 50 46.0	1 13 4.1	14.0	268 9 37.4	+0 3 41.7
14.5	213 45 33.3	4 31 1.2	14.5	264 58 21.7	+0 35 21.3	14.5	275 11 11.3	−0 33 25.5
15.0	220 31 6.4	4 10 5.6	15.0	272 10 58.7	−0 3 20.2	15.0	282 16 5.2	1 10 18.6
15.5	227 22 55.4	3 45 17.1	15.5	279 28 19.5	0 42 21.6	15.5	289 24 12.8	1 46 21.0
16.0	234 21 9.0	+3 16 46.7	16.0	286 49 57.0	−1 21 1.2	16.0	296 35 21.5	−2 20 55.8
16.5	241 25 48.1	2 44 51.1	16.5	294 15 13.6	1 58 35.0	16.5	303 49 12.0	2 53 26.0
17.0	248 36 45.6	2 9 52.5	17.0	301 43 22.0	2 34 18.4	17.0	311 5 17.0	3 23 15.5
17.5	255 53 44.5	1 32 19.4	17.5	309 13 25.6	3 7 28.0	17.5	318 23 1.8	3 49 50.6
18.0	263 16 16.9	0 52 46.7	18.0	316 44 20.3	3 37 23.5	18.0	325 41 44.5	4 12 41.5
18.5	270 43 44.1	+0 11 55.3	18.5	324 14 56.4	−4 3 29.4	18.5	333 0 36.4	−4 31 22.4
19.0	278 15 16.6	−0 29 29.2	19.0	331 44 1.9	4 25 16.5	19.0	340 18 45.3	4 45 33.9
19.5	285 49 54.8	1 10 37.4	19.5	339 10 25.5	4 42 23.4	19.5	347 35 15.3	4 55 3.0
20.0	293 26 30.7	1 50 38.5	20.0	346 32 59.7	4 54 37.1	20.0	354 49 10.8	4 59 43.4
20.5	301 3 50.3	2 28 42.7	20.5	353 50 43.9	5 1 52.6	20.5	1 59 38.6	4 59 36.3
21.0	308 40 36.0	−3 4 2.9	21.0	1 2 46.7	−5 4 12.9	21.0	9 5 49.6	−4 54 49.4
21.5	316 15 30.2	3 35 57.2	21.5	8 8 27.6	5 1 47.7	21.5	16 7 2.0	4 45 36.2
22.0	323 47 18.5	4 3 50.9	22.0	15 7 17.7	4 54 52.5	22.0	23 2 41.6	4 32 15.3
22.5	331 14 52.6	4 27 17.4	22.5	21 59 0.6	4 43 47.0	22.5	29 52 23.6	4 15 9.0
23.0	338 37 13.0	4 45 58.9	23.0	28 43 31.4	4 28 53.5	23.0	36 35 53.1	3 54 42.2
23.5	345 53 30.9	−4 59 45.9	23.5	35 20 55.7	−4 10 36.3	23.5	43 13 4.7	−3 31 21.4
24.0	353 3 9.4	5 8 37.0	24.0	41 51 28.4	3 49 20.4	24.0	49 44 2.3	3 5 33.5
24.5	0 5 44.0	5 12 37.6	24.5	48 15 32.7	3 25 30.2	24.5	56 8 58.1	2 37 44.9
25.0	7 1 2.3	5 11 58.3	25.0	54 33 37.7	2 59 30.0	25.0	62 28 11.7	2 8 21.4
25.5	13 49 2.8	5 6 54.3	25.5	60 46 17.7	2 31 42.9	25.5	68 42 9.1	1 37 47.5
26.0	20 29 53.9	−4 57 43.6	26.0	66 54 10.2	−2 2 30.8	26.0	74 51 21.3	−1 6 26.1
26.5	27 3 52.2	4 44 46.1	26.5	72 57 55.3	1 32 14.5	26.5	80 56 23.5	0 34 38.5
27.0	33 31 21.5	4 28 22.7	27.0	78 58 14.4	1 1 13.7	27.0	86 57 53.9	−0 2 44.9
27.5	39 52 50.6	4 8 54.5	27.5	84 55 48.9	−0 29 47.2	27.5	92 56 32.4	+0 28 56.1
28.0	46 8 52.0	3 46 42.8	28.0	90 51 20.1	+0 1 46.9	28.0	98 53 0.4	1 0 6.9
28.5	52 20 0.9	3 22 8.5	28.5	96 45 27.9	0 33 11.0	28.5	104 47 59.9	1 30 30.9
29.0	58 26 53.7	−2 55 31.8	29.0	102 38 50.8	+1 4 8.0	29.0	110 42 11.9	+1 59 51.9
29.5	64 30 7.3	2 27 12.6	29.5	108 32 5.1	1 34 21.0	29.5	116 36 17.6	2 27 54.4
30.0	70 30 18.4	1 57 30.3	30.0	114 25 44.5	2 3 33.2	30.0	122 30 56.1	2 54 23.0
30.5	76 28 2.6	1 26 43.8	30.5	120 20 19.8	2 31 27.7	30.5	128 26 44.3	3 19 2.4
31.0	82 23 54.1	0 55 11.8	31.0	126 16 18.6	2 57 47.6	31.0	134 24 16.8	3 41 37.6
31.5	88 18 25.2	−0 23 13.0	31.5	132 14 5.1	+3 22 16.1	31.5	140 24 5.5	+4 1 53.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	146° 26' 38.2	+4° 19' 35.2	1.0	179° 17' 48.2	+5° 7' 50.0	1.0	227° 20' 23.3	+3° 8' 38.6
1.5	152 32 19.3	4 34 27.8	1.5	185 43 2.4	5 3 10.7	1.5	234 21 19.5	2 36 10.8
2.0	158 41 28.6	4 46 17.2	2.0	192 13 18.1	4 54 33.9	2.0	241 27 21.7	2 0 54.3
2.5	164 54 21.3	4 54 50.3	2.5	198 48 36.9	4 41 57.0	2.5	248 37 58.0	1 23 19.8
3.0	171 11 8.1	4 59 55.1	3.0	205 28 54.2	4 25 20.9	3.0	255 52 30.4	0 44 3.3
3.5	177 31 54.3	+5 1 21.4	3.5	212 13 59.5	+4 4 50.8	3.5	263 10 15.0	+0 3 45.4
4.0	183 56 41.2	4 59 0.9	4.0	219 3 36.8	3 40 36.6	4.0	270 30 24.2	-0 36 50.1
4.5	190 25 25.4	4 52 48.3	4.5	225 57 24.6	3 12 53.6	4.5	277 52 7.6	1 16 58.1
5.0	196 57 58.7	4 42 41.5	5.0	232 54 57.5	2 42 1.9	5.0	285 14 34.5	1 55 53.1
5.5	203 34 10.5	4 28 41.9	5.5	239 55 46.7	2 8 26.8	5.5	292 36 54.5	2 32 51.5
6.0	210 13 47.3	+4 10 54.9	6.0	246 59 21.2	+1 32 38.2	6.0	299 58 19.4	-3 7 12.9
6.5	216 56 33.5	3 49 30.0	6.5	254 5 8.9	0 55 10.0	6.5	307 18 5.1	3 38 21.5
7.0	223 42 12.6	3 24 40.9	7.0	261 12 37.8	+0 16 38.8	7.0	314 35 32.2	4 5 47.0
7.5	230 30 28.1	2 56 45.4	7.5	268 21 16.8	-0 22 16.5	7.5	321 50 6.4	4 29 5.0
8.0	237 21 4.2	2 26 5.3	8.0	275 30 36.6	1 0 56.1	8.0	329 1 19.4	4 47 57.6
8.5	244 13 46.7	+1 53 5.6	8.5	282 40 10.2	-1 38 40.7	8.5	336 8 48.8	-5 2 13.2
9.0	251 8 23.0	1 18 14.8	9.0	289 49 33.3	2 14 52.2	9.0	343 12 18.1	5 11 45.8
9.5	258 4 42.6	0 42 3.4	9.5	296 58 24.4	2 48 54.7	9.5	350 11 36.0	5 16 34.8
10.0	265 2 36.8	+0 5 40.0	10.0	304 6 24.6	3 20 15.5	10.0	357 6 36.0	5 16 44.4
10.5	272 1 58.7	-0 32 9.3	10.5	311 13 17.1	3 48 25.4	10.5	3 57 15.7	5 12 23.2
11.0	279 2 42.7	-1 9 1.8	11.0	318 18 47.3	-4 12 59.2	11.0	10 43 36.3	-5 3 43.0
11.5	286 4 43.5	1 44 58.6	11.5	325 22 42.1	4 33 36.3	11.5	17 25 41.7	4 50 58.8
12.0	293 7 55.6	2 19 25.4	12.0	332 24 49.3	4 50 0.5	12.0	24 3 37.8	4 34 28.0
12.5	300 12 12.0	2 51 48.9	12.5	339 24 57.2	5 2 0.0	12.5	30 37 32.4	4 14 29.9
13.0	307 17 23.9	3 21 37.4	13.0	346 22 54.6	5 9 28.1	13.0	37 7 34.2	3 51 25.7
13.5	314 23 19.6	-3 48 21.7	13.5	353 18 30.0	-5 12 22.5	13.5	43 33 52.5	-3 25 37.8
14.0	321 29 43.8	4 11 35.2	14.0	0 11 32.0	5 10 45.1	14.0	49 56 37.2	2 57 29.3
14.5	328 36 17.2	4 30 55.3	14.5	7 1 48.8	5 4 42.5	14.5	56 15 58.5	2 27 24.4
15.0	335 42 36.6	4 46 3.3	15.0	13 49 8.9	4 54 24.9	15.0	62 32 6.9	1 55 47.2
15.5	342 48 15.2	4 56 45.4	15.5	20 33 21.1	4 40 6.4	15.5	68 45 13.0	1 23 2.0
16.0	349 52 42.7	-5 2 52.8	16.0	27 14 14.7	-4 22 4.5	16.0	74 55 27.6	-0 49 33.1
16.5	356 55 26.8	5 4 22.4	16.5	33 51 40.3	4 0 39.0	16.5	81 3 2.1	-0 15 44.0
17.0	3 55 53.6	5 1 16.5	17.0	40 25 29.7	3 36 12.5	17.0	87 8 8.3	+0 18 2.2
17.5	10 53 29.8	4 53 42.6	17.5	46 55 37.1	3 9 9.4	17.5	93 10 58.9	0 51 23.4
18.0	17 47 43.4	4 41 53.6	18.0	53 21 58.3	2 39 55.1	18.0	99 11 47.5	1 23 58.7
18.5	24 38 5.2	-4 26 6.6	18.5	59 44 32.7	-2 8 55.4	18.5	105 10 48.9	+1 55 23.2
19.0	31 24 10.3	4 6 42.4	19.0	66 3 22.1	1 36 36.5	19.0	111 8 19.3	2 25 33.4
19.5	38 5 38.9	3 44 4.9	19.5	72 18 31.6	1 3 24.4	19.5	117 4 36.2	2 53 57.1
20.0	44 42 16.7	3 18 39.8	20.0	78 30 9.8	-0 29 43.9	20.0	122 59 58.9	3 20 23.5
20.5	51 13 56.2	2 50 54.1	20.5	84 38 28.5	+0 4 1.1	20.5	128 54 48.2	3 44 38.0
21.0	57 40 35.8	-2 21 14.8	21.0	90 43 42.9	+0 37 28.0	21.0	134 49 26.9	+4 6 27.3
21.5	64 2 20.6	1 50 8.9	21.5	96 46 11.3	1 10 15.6	21.5	140 44 19.6	4 25 39.3
22.0	70 19 21.7	1 18 2.4	22.0	102 46 15.1	1 42 4.3	22.0	146 39 52.6	4 42 2.7
22.5	76 31 55.5	0 45 20.1	22.5	108 44 18.7	2 12 36.1	22.5	152 36 33.8	4 55 27.5
23.0	82 40 23.9	-0 12 24.9	23.0	114 40 48.9	2 41 34.2	23.0	158 34 52.6	5 5 44.2
23.5	88 45 13.0	+0 20 21.4	23.5	120 36 14.9	+3 8 43.2	23.5	164 35 19.9	+5 12 44.2
24.0	94 46 52.7	0 52 38.7	24.0	126 31 7.9	3 33 48.7	24.0	170 38 27.5	5 16 19.8
24.5	100 45 55.9	1 24 8.4	24.5	132 26 0.9	3 56 37.3	24.5	176 44 47.7	5 16 23.9
25.0	106 42 58.1	1 54 33.4	25.0	138 21 28.4	4 16 56.5	25.0	182 54 52.8	5 12 50.6
25.5	112 38 36.6	2 23 37.8	25.5	144 18 5.5	4 34 34.3	25.5	189 9 14.7	5 5 34.7
26.0	118 33 29.9	+2 51 6.3	26.0	150 16 28.0	+4 49 19.1	26.0	195 28 24.6	+4 54 32.8
26.5	124 28 17.2	3 16 44.3	26.5	156 17 11.7	5 0 59.7	26.5	201 52 51.4	4 39 43.2
27.0	130 23 37.8	3 40 18.0	27.0	162 20 52.1	5 9 25.5	27.0	208 23 1.1	4 21 6.4
27.5	136 20 10.6	4 1 33.8	27.5	168 28 3.3	5 14 26.6	27.5	214 59 16.1	3 58 45.8
28.0	142 18 33.2	4 20 18.2	28.0	174 39 17.8	5 15 53.3	28.0	221 41 53.7	3 32 48.7
28.5	148 19 21.8	4 36 17.9	28.5	180 55 5.3	5 13 36.9	28.5	228 31 5.1	3 3 26.5
29.0	154 23 10.3	+4 49 20.1	29.0	187 15 53.0	+5 7 30.3	29.0	235 26 54.1	+2 30 55.4
29.5	160 30 29.9	4 59 12.0	29.5	193 42 3.5	4 57 28.1	29.5	242 29 16.4	1 55 37.4
30.0	166 41 48.0	5 5 41.6	30.0	200 13 54.3	4 43 27.3	30.0	249 37 58.0	1 18 0.2
30.5	172 57 27.9	5 8 37.6	30.5	206 51 37.8	4 25 27.8	30.5	256 52 35.5	+0 38 37.4
31.0	179 17 48.2	5 7 50.0	31.0	213 35 19.4	4 3 33.4	31.0	264 12 35.3	-0 1 51.7
31.5	185 43 2.4	+5 3 10.7	31.5	220 24 57.7	+3 37 52.5	31.5	271 37 13.8	-0 42 43.4

FOR GREENWICH MEAN NOON AND MIDNIGHT.								
Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	264° 12' 35.3"	—0° 1' 51.7"	1.0	317° 50' 41.6"	—4° 12' 10.4"	1.0	11° 10' 40.2"	—4° 41' 36.4"
1.5	271 37 13.8	0 42 43.4	1.5	325 28 30.5	4 33 24.1	1.5	18 22 33.6	4 25 57.6
2.0	279 5 38.2	1 23 10.6	2.0	333 4 0.7	4 49 40.5	2.0	25 27 17.4	4 6 26.3
2.5	286 36 48.4	2 2 24.5	2.5	340 35 56.4	5 0 46.4	2.5	32 24 34.1	3 43 32.8
3.0	294 9 38.7	2 39 37.3	3.0	348 3 10.4	5 6 37.8	3.0	39 14 19.4	3 17 48.7
3.5	301 42 59.9	—3 14 3.5	3.5	355 24 46.5	—5 7 19.0	3.5	45 56 40.2	—2 49 45.5
4.0	309 15 42.0	3 45 2.1	4.0	2 40 0.8	5 3 1.9	4.0	52 31 52.9	2 19 53.4
4.5	316 46 37.3	4 11 58.6	4.5	9 48 22.1	4 54 4.0	4.5	59 0 21.9	1 48 41.2
5.0	324 14 42.8	4 34 26.1	5.0	16 49 32.7	4 40 47.7	5.0	65 22 37.4	1 16 35.8
5.5	331 39 1.8	4 52 5.6	5.5	23 43 26.8	4 23 38.1	5.5	71 39 14.1	0 44 1.9
6.0	338 58 47.0	—5 4 46.2	6.0	30 30 8.9	—4 3 2.0	6.0	77 50 50.2	—0 11 22.2
6.5	346 13 20.0	5 12 24.7	6.5	37 9 53.0	3 39 27.3	6.5	83 58 4.6	+0 21 2.3
7.0	353 22 12.8	5 15 4.8	7.0	43 43 0.3	3 13 21.2	7.0	90 1 37.5	0 52 52.2
7.5	0 25 7.5	5 12 56.1	7.5	50 9 57.5	2 45 10.3	7.5	96 2 8.4	1 23 49.6
8.0	7 21 55.4	5 6 12.5	8.0	56 31 15.5	2 15 20.3	8.0	102 0 16.1	1 53 37.9
8.5	14 12 36.2	—4 55 12.0	8.5	62 47 27.5	—1 44 15.7	8.5	107 56 37.1	+2 22 1.3
9.0	20 57 16.7	4 40 14.8	9.0	68 59 8.4	1 12 20.0	9.0	113 51 46.3	2 48 45.0
9.5	27 36 9.9	4 21 42.9	9.5	75 6 53.5	0 39 55.1	9.5	119 46 16.0	3 13 34.7
10.0	34 9 33.0	3 59 59.4	10.0	81 11 16.8	—0 7 21.8	10.0	125 40 35.4	3 36 16.7
10.5	40 37 47.0	3 35 28.0	10.5	87 12 52.3	+0 24 59.7	10.5	131 35 10.6	3 56 38.4
11.0	47 1 15.0	—3 8 32.5	11.0	93 12 11.1	+0 56 50.3	11.0	137 30 25.0	+4 14 27.5
11.5	53 20 21.2	2 39 36.7	11.5	99 9 42.9	1 27 51.6	11.5	143 26 38.5	4 29 32.4
12.0	59 35 30.5	2 9 4.0	12.0	105 5 55.1	1 57 45.9	12.0	149 24 8.2	4 41 42.7
12.5	65 47 7.8	1 37 17.6	12.5	111 1 12.3	2 26 16.6	12.5	155 23 8.1	4 50 49.2
13.0	71 55 37.0	1 4 40.4	13.0	116 55 56.6	2 53 7.3	13.0	161 23 49.8	4 56 43.7
13.5	78 1 21.1	—0 31 34.4	13.5	122 50 27.9	+3 18 2.6	13.5	167 26 22.6	+4 59 19.7
14.0	84 4 41.7	+0 1 38.8	14.0	128 45 3.8	3 40 47.8	14.0	173 30 53.7	4 58 32.4
14.5	90 5 59.1	0 34 37.9	14.5	134 39 59.6	4 1 9.2	14.5	179 37 29.3	4 54 19.0
15.0	96 5 32.3	1 7 2.6	15.0	140 35 29.1	4 18 54.5	15.0	185 46 14.4	4 46 38.7
15.5	102 3 38.8	1 38 33.2	15.5	146 31 44.9	4 33 52.0	15.5	191 57 13.9	4 35 32.9
16.0	108 0 35.1	+2 8 51.0	16.0	152 28 57.8	+4 45 51.7	16.0	198 10 32.8	+4 21 5.4
16.5	113 56 36.7	2 37 38.2	16.5	158 27 19.2	4 54 45.0	16.5	204 26 17.1	4 3 22.3
17.0	119 51 59.5	3 4 38.0	17.0	164 26 59.4	5 0 24.5	17.0	210 44 33.9	3 42 32.3
17.5	125 46 55.1	3 29 34.8	17.5	170 28 9.7	5 2 44.8	17.5	217 5 31.7	3 18 46.4
18.0	131 41 41.2	3 52 14.0	18.0	176 31 1.7	5 1 41.9	18.0	223 29 21.0	2 52 17.9
18.5	137 36 31.6	+4 12 22.5	18.5	182 35 48.5	+4 57 13.4	18.5	229 56 14.5	+2 23 22.8
19.0	143 31 41.8	4 29 48.3	19.0	188 42 44.7	4 49 19.1	19.0	236 26 26.2	1 52 19.2
19.5	149 27 28.2	4 44 21.0	19.5	194 52 6.6	4 38 0.1	19.5	243 0 11.9	1 19 27.7
20.0	155 24 8.6	4 55 51.0	20.0	201 4 12.4	4 23 19.6	20.0	249 37 48.2	0 45 11.1
20.5	161 22 2.1	5 4 10.4	20.5	207 19 22.2	4 5 22.5	20.5	256 19 32.3	+0 9 54.6
21.0	167 21 29.3	+5 9 12.3	21.0	213 37 58.2	+3 44 16.0	21.0	263 5 40.2	—0 25 54.1
21.5	173 22 52.9	5 10 51.0	21.5	220 0 24.0	3 20 8.9	21.5	269 56 26.6	1 1 45.2
22.0	179 26 37.0	5 9 2.1	22.0	226 27 4.1	2 53 12.7	22.0	276 52 2.8	1 37 6.8
22.5	185 33 7.5	5 3 42.6	22.5	232 58 23.8	2 23 41.5	22.5	283 52 35.6	2 11 25.3
23.0	191 42 51.8	4 54 50.6	23.0	239 34 47.7	1 51 51.8	23.0	290 58 5.7	2 44 5.9
23.5	197 56 18.2	+4 42 25.6	23.5	246 16 39.2	+1 18 4.0	23.5	298 8 26.3	—3 14 32.5
24.0	204 13 56.1	4 26 29.0	24.0	253 4 18.9	0 42 41.0	24.0	305 23 21.5	3 42 9.8
24.5	210 36 14.7	4 7 3.8	24.5	259 58 3.2	+0 6 10.0	24.5	312 42 25.8	4 6 23.7
25.0	217 3 43.0	3 44 15.6	25.0	266 58 2.8	—0 30 58.3	25.0	320 5 3.4	4 26 42.5
25.5	223 36 48.2	3 18 12.5	25.5	274 4 20.8	1 8 9.7	25.5	327 30 28.2	4 42 39.0
26.0	230 15 55.1	+2 49 5.8	26.0	281 16 51.1	—1 44 46.3	26.0	334 57 44.8	—4 53 51.0
26.5	237 1 24.8	2 17 10.9	26.5	288 35 16.5	2 20 7.8	26.5	342 25 50.9	5 0 3.3
27.0	243 53 32.9	1 42 47.1	27.0	295 59 8.5	2 53 32.2	27.0	349 53 38.7	5 1 8.1
27.5	250 52 28.5	1 6 18.9	27.5	303 27 45.3	3 24 17.4	27.5	357 19 58.4	4 57 5.9
28.0	257 58 12.4	+0 28 15.4	28.0	311 0 13.4	3 51 42.8	28.0	4 43 40.8	4 48 5.5
28.5	265 10 35.4	—0 10 48.8	28.5	318 35 27.7	4 15 11.5	28.5	12 3 41.4	4 34 22.7
29.0	272 29 17.2	—0 50 14.3	29.0	326 12 14.4	—4 34 11.4	29.0	19 19 2.0	—4 16 20.3
29.5	279 53 46.0	1 29 17.8	29.5	333 49 13.0	4 48 18.6	29.5	26 28 53.8	3 54 26.0
30.0	287 23 17.2	2 7 13.3	30.0	341 25 0.5	4 57 16.7	30.0	33 32 38.7	3 29 11.1
30.5	294 56 54.8	2 43 12.9	30.5	348 58 15.2	5 0 59.2	30.5	40 29 50.0	3 1 9.2
31.0	302 33 32.4	3 16 30.4	31.0	356 27 40.4	4 59 28.2	31.0	47 20 12.3	2 30 54.4
31.5	310 11 54.9	—3 46 22.2	31.5	3 52 7.7	—4 52 54.6	31.5	54 3 41.3	—1 59 0.0

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	47° 20' 12.3	-2° 30' 54.4	1.0	93° 55' 23.1	+1° 40' 41.7	1.0	126° 0' 17.5	+4° 7' 48.7
1.5	54 3 41.3	1 59 0.0	1.5	100 4 59.9	2 11 52.6	1.5	131 58 40.4	4 27 2.8
2.0	60 40 23.0	1 25 58.1	2.0	106 10 50.2	2 41 14.6	2.0	137 55 39.2	4 43 19.4
2.5	67 10 32.1	0 52 18.5	2.5	112 13 27.2	3 8 32.9	2.5	143 51 45.8	4 56 31.5
3.0	73 34 30.7	-0 18 28.8	3.0	118 13 26.0	3 33 34.7	3.0	149 47 34.0	5 6 33.0
3.5	79 52 47.1	+0 15 6.3	3.5	124 11 23.5	+3 56 8.6	3.5	155 43 38.6	+5 13 18.7
4.0	86 5 54.1	0 48 4.4	4.0	130 7 57.4	4 16 4.2	4.0	161 40 35.2	5 16 44.4
4.5	92 14 27.9	1 20 5.6	4.5	136 3 45.2	4 33 12.5	4.5	167 38 59.4	5 16 46.0
5.0	98 19 7.0	1 50 52.0	5.0	141 59 24.5	4 47 24.9	5.0	173 39 26.8	5 13 20.5
5.5	104 20 31.3	2 20 7.5	5.5	147 55 32.0	4 58 33.7	5.5	179 42 32.2	5 6 25.7
6.0	110 19 21.1	+2 47 37.6	6.0	153 52 43.2	+5 6 31.7	6.0	185 48 49.0	+4 56 0.5
6.5	116 16 16.0	3 13 8.8	6.5	159 51 31.6	5 11 12.3	6.5	191 58 48.6	4 42 5.1
7.0	122 11 55.1	3 36 28.8	7.0	165 52 28.7	5 12 29.6	7.0	198 13 0.2	4 24 41.3
7.5	128 6 56.0	3 57 25.9	7.5	171 56 2.9	5 10 18.7	7.5	204 31 49.4	4 3 52.9
8.0	134 1 53.9	4 15 49.1	8.0	178 2 39.8	5 4 35.9	8.0	210 55 37.8	3 39 46.4
8.5	139 57 21.7	+4 31 28.2	8.5	184 12 41.5	+4 55 18.9	8.5	217 24 42.3	+3 12 31.7
9.0	145 53 49.5	4 44 13.4	9.0	190 26 26.0	4 42 27.3	9.0	223 59 14.5	2 42 22.1
9.5	151 51 44.6	4 53 55.5	9.5	196 44 7.3	4 26 2.9	9.5	230 39 19.9	2 9 35.0
10.0	157 51 30.7	5 0 26.4	10.0	203 5 55.0	4 6 10.4	10.0	237 24 57.5	1 34 32.2
10.5	163 53 27.9	5 3 38.6	10.5	209 31 54.2	3 42 57.6	10.5	244 15 59.1	0 57 40.1
11.0	169 57 53.1	+5 3 26.5	11.0	216 2 5.6	+3 16 35.7	11.0	251 12 9.8	+0 19 29.6
11.5	176 4 59.2	4 50 45.7	11.5	222 36 25.8	2 47 19.7	11.5	258 13 7.6	-0 19 24.5
12.0	182 14 56.1	4 52 33.7	12.0	229 14 47.5	2 15 28.7	12.0	265 18 23.8	0 58 23.9
12.5	188 27 50.2	4 41 50.1	12.5	235 56 59.6	1 41 25.6	12.5	272 27 24.3	1 36 48.2
13.0	194 43 44.9	4 27 37.1	13.0	242 42 48.3	1 5 36.9	13.0	279 39 29.9	2 13 55.9
13.5	201 2 41.7	+4 10 0.0	13.5	249 31 57.2	+0 28 32.6	13.5	286 53 57.6	-2 49 5.9
14.0	207 24 39.7	3 49 6.5	14.0	256 24 8.4	-0 9 14.7	14.0	294 10 2.4	3 21 38.7
14.5	213 49 36.4	3 25 7.6	14.5	263 19 2.8	0 47 10.4	14.5	301 28 58.5	3 50 58.2
15.0	220 17 28.8	2 58 17.7	15.0	270 16 21.0	1 24 38.2	15.0	308 44 1.0	4 16 33.0
15.5	226 48 13.5	2 28 54.0	15.5	277 15 43.3	2 1 2.0	15.5	316 0 27.4	4 37 56.8
16.0	233 21 47.5	+1 57 16.7	16.0	284 16 50.6	-2 35 46.0	16.0	323 15 38.3	-4 54 49.4
16.5	239 58 8.5	1 23 49.0	16.5	291 19 24.8	3 8 15.7	16.5	330 28 58.7	5 6 56.7
17.0	246 37 15.4	0 48 56.3	17.0	298 23 8.3	3 37 53.9	17.0	337 39 59.0	5 14 11.2
17.5	253 19 8.2	+0 13 6.2	17.5	305 27 44.5	4 4 26.1	17.5	344 48 14.8	5 16 31.1
18.0	260 3 48.2	-0 23 12.0	18.0	312 32 57.4	4 27 11.5	18.0	351 53 26.9	5 14 0.3
18.5	266 51 17.6	-0 59 27.4	18.5	319 38 31.6	-4 45 52.9	18.5	358 55 21.3	-5 6 47.5
19.0	273 41 39.1	1 35 8.3	19.0	326 44 11.5	5 0 12.5	19.0	5 53 48.5	4 55 6.0
19.5	280 34 55.6	2 9 42.2	19.5	333 49 41.9	5 9 57.2	19.5	12 48 43.0	4 39 12.5
20.0	287 31 8.9	2 42 36.7	20.0	340 54 46.8	5 14 58.4	20.0	19 40 2.6	4 19 27.1
20.5	294 30 19.4	3 13 20.2	20.5	347 59 9.6	5 15 12.5	20.5	26 27 47.8	3 56 12.3
21.0	301 32 24.6	-3 41 20.9	21.0	355 2 32.4	-5 10 40.9	21.0	33 12 0.8	-3 29 52.5
21.5	308 37 17.9	4 6 9.7	21.5	2 4 37.1	5 1 30.0	21.5	39 52 45.3	3 0 54.1
22.0	315 44 49.0	4 27 19.2	22.0	9 5 4.3	4 47 50.8	22.0	46 30 5.7	2 29 44.3
22.5	322 54 41.5	4 44 25.0	22.5	16 3 34.3	4 29 58.9	22.5	53 4 6.6	1 56 51.2
23.0	330 6 33.4	4 57 6.6	23.0	22 59 46.8	4 8 14.3	23.0	59 34 52.8	1 22 43.1
23.5	337 19 56.9	-5 5 8.1	23.5	29 53 21.7	-3 43 0.5	23.5	66 2 28.9	-0 47 48.4
24.0	344 34 18.3	5 8 18.8	24.0	36 43 59.7	3 14 44.2	24.0	72 26 59.3	-0 12 34.9
24.5	351 48 58.4	5 6 33.9	24.5	43 31 22.9	2 43 54.5	24.5	78 48 28.4	+0 22 30.2
25.0	359 3 14.2	4 59 55.1	25.0	50 15 14.8	2 11 2.1	25.0	85 7 0.7	0 57 1.0
25.5	6 16 19.9	4 48 30.6	25.5	56 55 21.7	1 36 39.0	25.5	91 22 40.9	1 30 33.1
26.0	13 27 28.6	-4 32 34.9	26.0	63 31 32.5	-1 1 16.9	26.0	97 35 34.3	+2 2 43.9
26.5	20 35 54.6	4 12 28.3	26.5	70 3 39.6	-0 25 26.8	26.5	103 45 47.2	2 33 12.7
27.0	27 40 54.5	3 48 35.9	27.0	76 31 39.9	+0 10 21.4	27.0	109 53 27.2	3 1 40.8
27.5	34 41 49.6	3 21 27.3	27.5	82 55 30.3	0 45 39.5	27.5	115 58 43.2	3 27 51.7
28.0	41 38 6.8	2 51 34.6	28.0	89 15 17.7	1 20 1.8	28.0	122 1 45.9	3 51 31.2
28.5	48 29 19.8	2 19 31.6	28.5	95 31 8.8	1 53 4.8	28.5	128 2 48.4	4 12 27.2
29.0	55 15 10.0	-1 45 52.4	29.0	101 43 15.3	+2 24 27.7	29.0	134 2 5.7	+4 30 29.6
29.5	61 55 25.7	1 11 10.5	29.5	107 51 52.8	2 53 52.3	29.5	139 59 55.2	4 45 30.1
30.0	68 30 4.4	0 35 57.8	30.0	113 57 20.4	3 21 2.7	30.0	145 56 37.0	4 57 22.3
30.5	74 59 9.7	-0 0 44.3	30.5	120 0 0.2	3 45 45.4	30.5	151 59 33.7	5 6 1.1
31.0	81 22 52.4	+0 34 2.6	31.0	126 0 17.5	4 7 48.7	31.0	157 48 10.3	5 11 22.7
31.5	87 41 29.5	+1 7 58.5	31.5	131 58 40.4	+4 27 2.8	31.5	163 43 54.1	+5 13 24.6

FOR GREENWICH MEAN NOON.						
Date.	THE MOON'S EQUATOR.			Mean Longitude of the Moon.	Mean Solar Days.	Motion of ζ
	i Inclination to Earth's Equator.	Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	Ω' Ascend'g Node on Earth's Equator.			
Jan. 0	23° 33.8	275° 57.7	356° 18.0	30° 14.6	0.1	1° 19.06
10	23 33.0	275 26.2	356 17.8	162 0.4	0.2	2 38.12
20	23 32.2	274 54.7	356 17.7	293 46.2	0.3	3 57.18
30	23 31.3	274 23.2	356 17.5	65 32.1	0.4	5 16.23
Feb. 9	23 30.5	273 51.6	356 17.4	197 17.9	0.5	6 35.29
					0.6	7 54.35
19	23 29.7	273 20.0	356 17.2	329 3.8	0.7	9 13.41
March 1	23 28.8	272 48.4	356 17.1	100 49.6	0.8	10 32.47
11	23 28.0	272 16.8	356 17.0	232 35.5	0.9	11 51.53
21	23 27.2	271 45.3	356 16.9	4 21.3	1.0	13 10.58
31	23 26.4	271 13.7	356 16.9	136 7.1	2.0	26 21.17
					3.0	39 31.75
April 10	23 25.6	270 42.1	356 16.8	267 53.0	4.0	52 42.33
20	23 24.8	270 10.4	356 16.8	39 38.8	5.0	65 52.92
30	23 24.0	269 38.7	356 16.8	171 24.6	6.0	79 3.50
May 10	23 23.2	269 7.0	356 16.8	303 10.5	7.0	92 14.09
20	23 22.3	268 35.2	356 16.9	74 56.3	8.0	105 24.67
					9.0	118 35.25
30	23 21.5	268 3.4	356 16.9	206 42.1	10.0	131 45.84
June 9	23 20.7	267 31.6	356 17.0	338 28.0	Hours.	0° 32.94
19	23 19.8	266 59.7	356 17.1	110 13.8		1 5.88
29	23 19.0	266 27.8	356 17.2	241 59.7	2	1 38.82
July 9	23 18.2	265 55.9	356 17.4	13 45.5	3	2 11.76
					4	2 44.70
19	23 17.4	265 24.0	356 17.5	145 31.3	5	3 17.65
29	23 16.6	264 52.1	356 17.6	277 17.2	6	3 50.59
Aug. 8	23 15.8	264 20.2	356 17.8	49 3.0	7	4 23.53
18	23 15.0	263 48.3	356 18.0	180 48.8	8	4 56.47
28	23 14.2	262 16.3	356 18.3	312 34.7	9	5 29.41
					10	6 2.35
Sept. 7	23 13.4	262 44.3	356 18.6	84 20.5	11	6 35.29
17	23 12.5	262 12.3	356 18.9	216 6.4	12	7 8.23
27	23 11.7	261 40.2	356 19.2	347 52.2	13	7 41.17
Oct. 7	23 10.9	261 8.1	356 19.5	119 38.0	14	8 14.11
17	23 10.1	260 36.0	356 19.8	251 23.9	15	8 47.06
					16	9 20.00
27	23 9.3	260 3.9	356 20.1	23 9.7	17	9 52.94
Nov. 6	23 8.5	259 31.8	356 20.5	154 55.5	18	10 25.88
16	23 7.7	258 59.7	356 20.9	286 41.4	19	10 58.82
26	23 6.9	258 27.6	356 21.3	58 27.2	20	11 31.76
Dec. 6	23 6.1	257 55.4	356 21.8	190 13.0	21	12 4.70
					22	12 37.64
16	23 5.3	257 23.2	356 22.2	321 58.9	23	
26	23 4.5	256 51.0	356 22.7	93 44.7		
36	23 3.7	256 18.7	356 23.2	225 30.6		

TABLE FOR THE LIBRATION OF THE MOON.

Argument, $(\Omega - \lambda)$ or $(\Omega - \lambda - 180^\circ)$.

$\Omega - \lambda$	$\Delta \lambda$	$\frac{1}{e}$	B		$\Omega - \lambda$	$\Delta \lambda$	$\frac{1}{e}$	B	
0	0.0	39	0 0.0	180	46	0.6	56	1 3.9	134
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	61	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	$\Delta \lambda$	$\frac{1}{e}$	B	$\Omega - \lambda$		$\Delta \lambda$	$\frac{1}{e}$	B	$\Omega - \lambda$

 $\Delta \lambda$ has the sign of $\tan (\lambda - \Omega)$ e has the sign of $\cos (\Omega - \lambda)$ B has the sign of $\sin (\Omega - \lambda)$

FOR GREENWICH MEAN NOON.								
Date.	Apparent Obliquity of the Ecliptic. (HANSEN.)	Equation of Equinoxes		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.	
		In Longitude.	In R. A.		Aberration.	Hor. Par.		
Jan. 0	23° 27' 11.88	— 16.88	— 1.032	0.00	— 20.80	9.00	92° 34.1	
10	12.04	16.50	1.009	1.38	20.79	9.00	92 2.4	
20	12.25	16.22	0.992	2.75	20.77	8.99	91 30.6	
30	12.51	16.09	0.984	4.13	20.74	8.98	90 58.8	
Feb. 9	12.78	16.09	0.984	5.50	20.71	8.96	90 27.0	
19	23 27 12.03	— 16.25	— 0.994	6.88	— 20.67	8.94	89 55.3	
March 1	13.24	16.54	1.012	8.26	20.63	8.92	89 23.5	
11	13.40	16.91	1.034	9.63	20.57	8.90	88 51.7	
21	13.50	17.32	1.059	11.01	20.51	8.87	88 20.0	
31	13.54	17.74	1.085	12.38	20.45	8.85	87 48.2	
April 10	23 27 13.52	— 18.09	— 1.106	13.76	— 20.39	8.82	87 16.4	
20	13.45	18.34	1.122	15.14	20.34	8.80	86 44.6	
30	13.34	18.47	1.130	16.51	20.29	8.78	86 12.9	
May 10	13.24	18.46	1.129	17.89	20.24	8.76	85 41.1	
20	13.15	18.31	1.120	19.26	20.19	8.74	85 9.3	
30	23 27 13.08	— 18.03	— 1.103	20.64	— 20.16	8.72	84 37.6	
June 9	13.06	17.65	1.079	22.02	20.13	8.71	84 5.8	
19	13.09	17.23	1.054	23.39	20.11	8.71	83 34.0	
29	13.18	16.81	1.028	24.77	20.11	8.70	83 2.2	
July 9	13.32	16.42	1.004	26.14	20.10	8.70	82 30.5	
19	23 27 13.51	— 16.09	— 0.984	27.52	— 20.12	8.71	81 58.7	
29	13.74	15.88	0.971	28.90	20.14	8.72	81 26.9	
Aug. 8	13.99	15.79	0.966	30.27	20.17	8.73	80 55.2	
18	14.24	15.83	0.968	31.65	20.20	8.75	80 23.4	
28	14.46	16.01	0.979	33.02	20.24	8.77	79 51.6	
Sept. 7	23 27 14.65	— 16.30	— 0.997	34.40	— 20.29	8.79	79 19.8	
17	14.79	16.66	1.019	35.78	20.35	8.81	78 48.1	
27	14.86	17.06	1.043	37.15	20.41	8.84	78 16.3	
Oct. 7	14.87	17.43	1.066	38.53	20.47	8.87	77 44.5	
17	14.82	17.73	1.084	39.90	20.53	8.88	77 12.7	
27	23 27 14.73	— 17.92	— 1.096	41.28	— 20.59	8.91	76 41.0	
Nov. 6	14.62	17.96	1.098	42.66	20.64	8.93	76 9.2	
16	14.51	17.85	1.091	44.03	20.69	8.95	75 37.4	
26	14.41	17.60	1.076	45.41	20.73	8.97	75 5.7	
Dec. 6	14.35	17.23	1.054	46.78	20.76	8.98	74 33.9	
16	23 27 14.35	— 16.77	— 1.026	48.16	— 20.78	8.99	74 2.1	
26	14.42	16.28	0.995	49.54	20.79	9.00	73 30.3	
36	23 27 14.55	— 15.81	— 0.967	50.91	— 20.79	9.00	72 58.6	
Mean Obliquity, 1890.0, 23° 27' 12".68 (HANSEN).							Daily Motion of Ω ✓ — 3".1773	
Mean Obliquity, 1890.0, 23° 27' 12".42 (PETERS).								
Precession for 1890				50".2615	log 1.70124			
Precession in a Solar Day				0".1376	log 9.13863			
Precession in a Sidereal Day				0".1372	log 9.13744			
Sun's Mean Equatorial Horizontal Parallax .				8".848	log 0.94685			

P A R T I I

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

**FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING
THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.**

NOTATION.

- τ , the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1889, December 30^d.680 = 1890, January 0^d.0—0^d.320, Washington mean time),
 α_0, δ_0 , the star's mean right ascension and declination at the beginning of the fictitious year,
 α, δ , the star's apparent right ascension and declination at the time τ ,
 μ, μ' , the annual proper motion in right ascension and declination,
 \odot , the sun's true longitude,
 Ω , the longitude of the moon's ascending node,
 ω , the obliquity of the ecliptic,
 Γ , the longitude of the sun's perigee,
 Γ' , the longitude of the moon's perigee,
 ζ , the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
 A &= \tau - 0.34249 \sin \Omega & - 0.00011 \sin (3 \odot - \Gamma) \\
 &+ 0.00410 \sin 2 \Omega & - 0.00005 \sin 2 (\odot - \Omega) \\
 &- 0.02521 \sin 2 \odot & + 0.00010 \sin 2 (\odot - \Gamma') \\
 &+ 0.00293 \sin (\odot + 82^\circ 4') & + 0.00009 \sin (2 \Gamma' - \Omega) \\
 &+ 0.00025 \sin (2 \odot - \Omega) & + 0.00005 \cos \Gamma' \\
 &- 0.00405 \sin 2 \zeta & + 0.00004 \sin 2 \Gamma' \\
 &+ 0.00135 \sin (\zeta - \Gamma') \\
 B &= - 9.2239 \cos \Omega & - 0.0027 \cos (3 \odot - \Gamma) \\
 &+ 0.0895 \cos 2 \Omega & + 0.0067 \cos (2 \odot - \Omega) \\
 &- 0.5506 \cos 2 \odot & + 0.0024 \cos (2 \Gamma' - \Omega) \\
 &- 0.0092 \cos (\odot + 281^\circ 3') & - 0.0023 \sin \Gamma' \\
 &- 0.0886 \cos 2 \zeta & + 0.0008 \cos 2 \Gamma' \\
 C &= - 20.4451 \cos \omega \cos \odot \\
 D &= - 20.4451 \sin \odot \\
 E &= - 0.0461 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0033 \sin 2 \odot
 \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned}
 a &= 3.07253 + 1.33687 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension} \\
 b &= \frac{1}{\tau} \cos \alpha_0 \tan \delta_0 \\
 c &= \frac{1}{\tau} \cos \alpha_0 \sec \delta_0 \\
 d &= \frac{1}{\tau} \sin \alpha_0 \sec \delta_0 \\
 a' &= 20''.0529 \cos \alpha_0 = \text{precession in declination} \\
 b' &= - \sin \alpha_0 \\
 c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\
 d' &= \cos \alpha_0 \sin \delta_0
 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned}
 \alpha &= \alpha_0 + \tau \mu + Aa + Bb + Cc + Dd + E & (\text{in time}) \\
 \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc})
 \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned}
 f &= 46''.0879 A + E \text{ (in arc)} = 3.07253 A + \frac{1}{\tau} E \text{ (in time)} \\
 g \sin G &= B & h \sin H &= C & i &= C \tan \omega \\
 g \cos G &= 20''.0529 A & h \cos H &= D
 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned}
 \alpha &= \alpha_0 + f + \tau \mu + \frac{1}{h} g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{h} h \sin (H + \alpha_0) \sec \delta_0 & (\text{in time}) \\
 \delta &= \delta_0 + \tau \mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc})
 \end{aligned}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 1	-9.5185	+9.9282	-0.5847	+1.3013	Feb. 15	-9.2726	-9.3570	-1.1993	+1.0403
2	9.5128	9.9376	0.6201	1.2996	16	9.2631	9.4502	1.2041	1.0281
3	9.5063	9.9404	0.6527	1.2977	17	9.2553	9.5388	1.2087	1.0153
4	9.4994	9.9344	0.6828	1.2957	18	9.2496	9.6141	1.2131	1.0020
^h (7.0) 5	9.4925	9.9184	0.7109	1.2936	19	9.2458	9.6722	1.2173	0.9882
6	-9.4860	+9.8928	-0.7372	+1.2913	^h (10.0) 20	-9.2437	-9.7117	-1.2213	+0.9739
7	9.4806	9.8693	0.7617	1.2889	21	9.2424	9.7335	1.2251	0.9590
8	9.4763	9.8214	0.7848	1.2864	22	9.2409	9.7399	1.2288	0.9433
9	9.4730	9.7839	0.8067	1.2837	23	9.2384	9.7343	1.2324	0.9268
10	9.4704	9.7530	0.8275	1.2808	24	9.2343	9.7212	1.2358	0.9095
11	-9.4683	+9.7336	-0.8471	+1.2777	25	-9.2282	-9.7070	-1.2390	+0.8915
12	9.4658	9.7277	0.8657	1.2744	26	9.2202	9.6988	1.2421	0.8726
13	9.4624	9.7336	0.8834	1.2710	27	9.2109	9.7025	1.2450	0.8527
14	9.4580	9.7461	0.9003	1.2675	28	9.2009	9.7209	1.2477	0.8316
15	9.4521	9.7582	0.9164	1.2638	Mar. 1	9.1914	9.7519	1.2503	0.8093
16	-9.4449	+9.7640	-0.9318	+1.2600	2	-9.1835	-9.7906	-1.2528	+0.7858
17	9.4367	9.7586	0.9466	1.2560	3	9.1776	9.8302	1.2551	0.7610
18	9.4290	9.7389	0.9608	1.2518	4	9.1740	9.8658	1.2572	0.7345
19	9.4195	9.7029	0.9744	1.2474	5	9.1724	9.8931	1.2592	0.7060
^h (6.0) 20	9.4118	9.6498	0.9874	1.2428	6	9.1722	9.9105	1.2611	0.6751
21	-9.4053	+0.5805	-0.9997	+1.2381	^h (11.0) 7	-9.1721	-9.9176	-1.2629	+0.6418
22	9.4003	9.4967	1.0116	1.2331	8	9.1711	9.9150	1.2646	0.6059
23	9.3967	9.4130	1.0231	1.2279	9	9.1682	9.9051	1.2661	0.5665
24	9.3940	9.3369	1.0342	1.2225	10	9.1628	9.8914	1.2674	0.5231
25	9.3917	9.2996	1.0450	1.2170	11	9.1544	9.8783	1.2685	0.4743
26	-9.3892	+9.2794	-1.0554	+1.2113	12	-9.1436	-9.8704	-1.2695	+0.4200
27	9.3857	9.2960	1.0653	1.2054	13	9.1312	9.8715	1.2704	0.3574
28	9.3807	9.3228	1.0749	1.1992	14	9.1181	9.8628	1.2712	0.2842
29	9.3743	9.3416	1.0841	1.1928	15	9.1057	9.9026	1.2718	0.1959
30	9.3668	9.3387	1.0930	1.1861	16	9.0952	9.9276	1.2723	0.0850
31	-9.3585	+9.3008	-1.1016	+1.1792	17	-9.0873	-9.9529	-1.2727	+0.9352
Feb. 1	9.3501	9.2127	1.1099	1.1721	18	9.0826	9.9748	1.2729	9.7054
2	9.3423	9.0394	1.1179	1.1647	19	9.0802	9.9903	1.2730	+9.1776
3	9.3358	+8.6503	1.1256	1.1570	20	9.0792	9.9978	1.2730	-9.3000
^h (9.0) 4	9.3309	-8.3838	1.1330	1.1491	21	9.0785	9.9969	1.2729	9.7433
5	-9.3276	-8.9455	-1.1402	+1.1409	^h (12.0) 22	-9.0766	-9.9889	-1.2727	-9.9580
6	9.3256	9.1458	1.1471	1.1324	23	9.0726	9.9748	1.2724	0.1006
7	9.3239	9.2425	1.1538	1.1236	24	9.0654	9.9587	1.2719	0.2076
8	9.3222	9.2851	1.1603	1.1144	25	9.0553	9.9444	1.2712	0.2933
9	9.3197	9.2882	1.1665	1.1049	26	9.0430	9.9354	1.2704	0.3647
10	-9.3158	-9.2655	-1.1725	+1.0961	27	-9.0290	-9.9348	-1.2694	-0.4257
11	9.3099	9.2333	1.1783	1.0849	28	9.0151	9.9430	1.2683	0.4793
12	9.3022	9.2125	1.1839	1.0743	29	9.0026	9.9584	1.2671	0.5267
13	9.2930	9.2232	1.1893	1.0633	30	8.9930	9.9773	1.2658	0.5694
14	9.2829	9.2749	1.1944	1.0520	31	8.9868	9.9959	1.2644	0.6080
15	-9.2726	-9.3570	-1.1993	+1.0403	Apr. 1	-8.9835	-0.0107	-1.2628	-0.6432
16	-9.2631	-9.4502	-1.2041	+1.0281	2	-8.9828	-0.0192	-1.2611	-0.6756

From January 1 to March 18, E = - 0°.04

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.
Apr. 1		-8.9835	-0.0107	-1.2628	-0.6432	May 17		+8.1113	-9.7985	-1.0071	-1.2351
2		8.9828	0.0192	1.2611	0.6756	18		8.2127	9.7643	0.9955	1.2398
3		8.9828	0.0200	1.2592	0.7059	19		8.3105	9.7339	0.9835	1.2443
4		8.9818	0.0131	1.2572	0.7342	20		8.3991	9.7140	0.9711	1.2485
5		8.9781	9.9996	1.2551	0.7605	21		8.4745	9.7089	0.9582	1.2525
^h (13.0) 6		-8.9706	-9.9814	-1.2529	-0.7848	^h (16.0) 22		+8.5359	-9.7190	-0.9447	-1.2564
7		8.9586	9.9619	1.2506	0.8078	23		8.5835	9.7404	0.9306	1.2602
8		8.9420	9.9450	1.2481	0.8297	24		8.6188	9.7661	0.9160	1.2639
9		8.9217	9.9347	1.2454	0.8504	25		8.6433	9.7899	0.9009	1.2674
10		8.8992	9.9332	1.2425	0.8700	26		8.6600	9.8062	0.8852	1.2707
11		-8.8763	-9.9405	-1.2395	-0.8886	27		+8.6728	-9.8121	-0.8687	-1.2738
12		8.8555	9.9541	1.2364	0.9062	28		8.6848	9.8061	0.8513	1.2768
13		8.8382	9.9703	1.2332	0.9231	29		8.6997	9.7880	0.8330	1.2797
14		8.8259	9.9855	1.2298	0.9393	30		8.7201	9.7599	0.8139	1.2825
15		8.8181	9.9959	1.2262	0.9548	31		8.7464	9.7257	0.7939	1.2852
16		-8.8136	-9.9994	-1.2225	-0.9696	June 1		+8.7779	-9.6915	-0.7727	-1.2877
17		8.8099	9.9948	1.2187	0.9837	2		8.8124	9.6647	0.7502	1.2900
18		8.8044	9.9818	1.2147	0.9973	3		8.8474	9.6527	0.7264	1.2922
19		8.7953	9.9624	1.2105	1.0104	4		8.8802	9.6589	0.7011	1.2943
20		8.7807	9.9391	1.2061	1.0229	5		8.9095	9.6807	0.6742	1.2963
^h (14.0) 21		-8.7594	-9.9157	-1.2015	-1.0349	^h (17.0) 6		+8.9329	-9.7120	-0.6454	-1.2981
22		8.7314	9.8965	1.1968	1.0465	7		8.9518	9.7452	0.6143	1.2998
23		8.6984	9.8855	1.1919	1.0577	8		8.9659	9.7732	0.5808	1.3014
24		8.6622	9.8845	1.1868	1.0685	9		8.9766	9.7918	0.5444	1.3029
25		8.6265	9.8930	1.1816	1.0789	10		8.9851	9.7986	0.5043	1.3042
26		-8.5944	-9.9075	-1.1762	-1.0888	11		+8.9936	-9.7929	-0.4602	-1.3054
27		8.5688	9.9239	1.1706	1.0984	12		9.0034	9.7759	0.4109	1.3065
28		8.5513	9.9375	1.1648	1.1077	13		9.0156	9.7507	0.3552	1.3074
29		8.5403	9.9450	1.1588	1.1167	14		9.0305	9.7220	0.2913	1.3082
30		8.5327	9.9440	1.1525	1.1254	15		9.0478	9.6970	0.2160	1.3089
May 1		-8.5235	-9.9342	-1.1460	-1.1337	16		+9.0666	-9.6822	-0.1248	-1.3095
2		8.5073	9.9153	1.1393	1.1417	17		9.0854	9.6835	0.0090	1.3100
3		8.4793	9.8896	1.1324	1.1495	18		9.1030	9.7016	9.8507	1.3104
4		8.4352	9.8604	1.1253	1.1571	19		9.1184	9.7318	9.5983	1.3106
5		8.3694	9.8327	1.1180	1.1645	20		9.1308	9.7678	-8.9220	1.3106
^h (15.0) 6		-8.2774	-9.8115	-1.1104	-1.1716	^h (18.0) 21		+9.1405	-9.8023	+9.3586	-1.3106
7		8.1486	9.8014	1.1025	1.1784	22		9.1473	9.8303	9.7322	1.3105
8		7.9652	9.8038	1.0943	1.1850	23		9.1526	9.8486	9.9302	1.3102
9		7.6785	9.8165	1.0850	1.1914	24		9.1573	9.8558	0.0657	1.3098
10		-7.0086	9.8352	1.0772	1.1975	25		9.1626	9.8523	0.1687	1.3093
11		+7.2878	-9.8544	-1.0682	-1.2034	26		+9.1694	-9.8402	+0.2518	-1.3087
12		7.6107	9.8682	1.0589	1.2091	27		9.1783	9.8228	0.3214	1.3079
13		7.7520	9.8741	1.0492	1.2146	28		9.1899	9.8051	0.3813	1.3070
14		7.8420	9.8698	1.0392	1.2199	29		9.2034	9.7930	0.4338	1.3060
15		7.9243	9.8548	1.0289	1.2251	30		9.2179	9.7911	0.4804	1.3049
16		+8.0137	-9.8302	-1.0182	-1.2302	July 1		+9.2322	-9.8024	+0.5226	-1.3037
17		+8.1113	-9.7985	-1.0071	-1.2351	2		+9.2459	-9.8253	+0.5608	-1.3024

From March 17 to June 24, E = - 0".05

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.2322	-9.8024	+0.5226	-1.3037	Aug. 16	+9.4959	-0.2708	+1.1821	-1.0774
2	9.2459	9.8253	0.5608	1.3024	17	9.4966	0.2797	1.1873	1.0671
3	9.2577	9.8559	0.5958	1.3009	18	9.4972	0.2843	1.1923	1.0565
4	9.2674	9.8865	0.6281	1.2993	19	9.4983	0.2849	1.1972	1.0455
5	9.2749	9.9185	0.6580	1.2975	20	9.5002	0.2837	1.2019	1.0341
^h 6	+9.2805	-9.9420	+0.6859	-1.2956	^h (29.0) 21	+9.5033	-0.2791	+1.2064	-1.0222
(19.0) 7	9.2849	9.9572	0.7121	1.2936	22	9.5075	0.2762	1.2107	1.0098
8	9.2889	9.9638	0.7367	1.2915	23	9.5127	0.2757	1.2148	0.9968
9	9.2934	9.9621	0.7598	1.2892	24	9.5184	0.2788	1.2188	0.9833
10	9.2990	9.9545	0.7816	1.2868	25	9.5241	0.2860	1.2227	0.9693
11	+9.3059	-9.9446	+0.8023	-1.2843	26	+9.5292	-0.2866	+1.2264	-0.9547
12	9.3144	9.9360	0.8220	1.2817	27	9.5336	0.3094	1.2299	0.9394
13	9.3240	9.9329	0.8407	1.2789	28	9.5367	0.3226	1.2332	0.9234
14	9.3340	9.9383	0.8584	1.2759	29	9.5388	0.3344	1.2364	0.9068
15	9.3437	9.9529	0.8752	1.2728	30	9.5400	0.3434	1.2395	0.8894
16	+9.3524	-9.9748	+0.8914	-1.2696	31	+9.5407	-0.3489	+1.2424	-0.8710
17	9.3597	0.0010	0.9069	1.2663	Sept. 1	9.5414	0.3507	1.2452	0.8516
18	9.3652	0.0275	0.9217	1.2628	2	9.5425	0.3493	1.2478	0.8312
19	9.3691	0.0510	0.9360	1.2591	3	9.5444	0.3458	1.2503	0.8097
20	9.3719	0.0690	0.9497	1.2552	4	9.5472	0.3416	1.2527	0.7869
^h 21	+9.3740	-0.0805	+0.9628	-1.2512	^h (33.0) 5	+9.5508	-0.3385	+1.2549	-0.7626
(30.0) 22	9.3763	0.0856	0.9755	1.2471	6	9.5550	0.3378	1.2570	0.7368
23	9.3793	0.0852	0.9877	1.2428	7	9.5594	0.3405	1.2590	0.7093
24	9.3836	0.0809	0.9994	1.2383	8	9.5636	0.3467	1.2609	0.6801
25	9.3896	0.0753	1.0107	1.2337	9	9.5671	0.3555	1.2626	0.6483
26	+9.3969	-0.0716	+1.0216	-1.2289	10	+9.5698	-0.3659	+1.2642	-0.6138
27	9.4051	0.0724	1.0321	1.2239	11	9.5714	0.3760	1.2656	0.5762
28	9.4136	0.0798	1.0423	1.2187	12	9.5721	0.3845	1.2669	0.5348
29	9.4219	0.0932	1.0521	1.2133	13	9.5721	0.3904	1.2681	0.4889
30	9.4293	0.1118	1.0616	1.2076	14	9.5721	0.3929	1.2692	0.4380
31	+9.4354	-0.1329	+1.0707	-1.2018	15	+9.5722	-0.3921	+1.2701	-0.3789
Aug. 1	9.4400	0.1537	1.0795	1.1958	16	9.5731	0.3867	1.2709	0.3109
2	9.4433	0.1717	1.0881	1.1896	17	9.5748	0.3637	1.2716	0.2302
3	9.4457	0.1851	1.0964	1.1833	18	9.5775	0.3786	1.2722	0.1310
4	9.4475	0.1932	1.1044	1.1769	19	9.5812	0.3749	1.2726	0.0015
^h 5	+9.4495	-0.1959	+1.1122	-1.1702	^h (0.0) 20	+9.5856	-0.3738	+1.2722	-9.8158
(21.0) 6	9.4521	0.1945	1.1197	1.1631	21	9.5901	0.3758	1.2731	9.4839
7	9.4557	0.1910	1.1270	1.1558	22	9.5943	0.3810	1.2731	-8.6000
8	9.4604	0.1875	1.1340	1.1482	23	9.5979	0.3884	1.2731	+9.5947
9	9.4661	0.1863	1.1407	1.1404	24	9.6006	0.3966	1.2729	9.8714
10	+9.4723	-0.1893	+1.1472	-1.1322	25	+9.6024	-0.4043	+1.2725	+0.0387
11	9.4784	0.1972	1.1535	1.1238	26	9.6034	0.4102	1.2720	0.1593
12	9.4841	0.2097	1.1597	1.1151	27	9.6039	0.4132	1.2714	0.2535
13	9.4898	0.2255	1.1657	1.1062	28	9.6043	0.4131	1.2706	0.3306
14	9.4924	0.2422	1.1714	1.0970	29	9.6049	0.4099	1.2696	0.3963
15	+9.4947	-0.2579	+1.1768	-1.0874	30	+9.6062	-0.4045	+1.2686	+0.4532
16	+9.4959	-0.2708	+1.1821	-1.0774	Oct. 1	+9.6063	-0.3980	+1.2675	+0.5034

FOR WASHINGTON MEAN MIDNIGHT.									
Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+9.6083	-0.3980	+1.2678	+0.5034	Nov. 16	+9.7206	-0.3374	+1.0333	+1.2232
2	9.6112	0.3919	1.2665	0.5482	17	9.7241	0.3328	1.0222	1.2284
3	9.6147	0.3875	1.2651	0.5888	18	9.7269	0.3390	1.0106	1.2335
4	9.6184	0.3858	1.2636	0.6258	19	9.7290	0.3441	0.9985	1.2384
5	9.6222	0.3874	1.2620	0.6597	^h (4.0) 20	9.7307	0.3469	0.9960	1.2431
^h (1.0) 6	+9.6255	-0.3917	+1.2602	+0.6913	21	+9.7321	-0.3464	+0.9731	+1.2476
7	9.6281	0.3960	1.2583	0.7204	22	9.7335	0.3424	0.9698	1.2520
8	9.6298	0.4047	1.2562	0.7475	23	9.7353	0.3353	0.9457	1.2562
9	9.6308	0.4104	1.2540	0.7731	24	9.7375	0.3260	0.9309	1.2603
10	9.6311	0.4139	1.2517	0.7973	25	9.7404	0.3161	0.9155	1.2640
11	+9.6312	-0.4145	+1.2492	+0.8201	26	+9.7439	-0.3074	+0.8994	+1.2677
12	9.6314	0.4119	1.2465	0.8415	27	9.7477	0.3015	0.8897	1.2712
13	9.6320	0.4065	1.2437	0.8615	28	9.7517	0.2994	0.8851	1.2746
14	9.6334	0.3993	1.2408	0.8806	29	9.7555	0.3014	0.8465	1.2778
15	9.6359	0.3913	1.2377	0.8989	30	9.7589	0.3068	0.8269	1.2808
16	+9.6392	-0.3842	+1.2345	+0.9164	Dec. 1	+9.7618	-0.3140	+0.8063	+1.2837
17	9.6431	0.3792	1.2311	0.9331	2	9.7640	0.3215	0.7846	1.2864
18	9.6473	0.3773	1.2275	0.9491	3	9.7656	0.3274	0.7617	1.2889
19	9.6515	0.3787	1.2237	0.9644	^h (5.0) 4	9.7668	0.3304	0.7371	1.2913
20	9.6552	0.3827	1.2198	0.9790	5	9.7680	0.3300	0.7107	1.2936
^h (2.0) 21	+9.6582	-0.3883	+1.2158	+0.9930	6	+9.7693	-0.3260	+0.6826	+1.2957
22	9.6605	0.3938	1.2116	1.0065	7	9.7710	0.3191	0.6628	1.2977
23	9.6620	0.3960	1.2072	1.0195	8	9.7734	0.3106	0.6207	1.2996
24	9.6630	0.3996	1.2026	1.0320	9	9.7764	0.3023	0.5855	1.3013
25	9.6639	0.3981	1.1978	1.0440	10	9.7801	0.2958	0.5470	1.3028
26	+9.6648	-0.3934	+1.1928	+1.0555	11	+9.7840	-0.2927	+0.5046	+1.3042
27	9.6662	0.3860	1.1876	1.0666	12	9.7881	0.2938	0.4572	1.3055
28	9.6682	0.3771	1.1823	1.0772	13	9.7920	0.2968	0.4045	1.3066
29	9.6710	0.3681	1.1768	1.0875	14	9.7955	0.3069	0.3440	1.3076
30	9.6745	0.3604	1.1710	1.0975	15	9.7985	0.3162	0.2733	1.3084
31	+9.6784	-0.3554	+1.1650	+1.1072	16	+9.8009	-0.3250	+0.1887	+1.3091
Nov. 1	9.6823	0.3539	1.1587	1.1165	17	9.8027	0.3317	0.0894	1.3097
2	9.6859	0.3557	1.1522	1.1255	18	9.8043	0.3354	9.9442	1.3101
3	9.6890	0.3600	1.1454	1.1342	19	9.8058	0.3356	9.7372	1.3104
4	9.6914	0.3654	1.1384	1.1426	^h (6.0) 20	9.8074	0.3324	+9.3270	1.3106
^h (3.0) 5	+9.6931	-0.3704	+1.1312	+1.1507	21	+9.8095	-0.3268	-9.0766	+1.3106
6	9.6942	0.3736	1.1238	1.1585	22	9.8120	0.3203	9.6565	1.3105
7	9.6949	0.3739	1.1162	1.1650	23	9.8151	0.3146	9.8669	1.3102
8	9.6956	0.3708	1.1083	1.1731	24	9.8185	0.3113	0.0493	1.3098
9	9.6967	0.3645	1.1000	1.1801	25	9.8220	0.3116	0.1623	1.3093
10	+9.6964	-0.3556	+1.0914	+1.1869	26	+9.8255	-0.3160	-0.2517	+1.3086
11	9.7009	0.3457	1.0825	1.1935	27	9.8287	0.3239	0.3259	1.3078
12	9.7041	0.3361	1.0734	1.2000	28	9.8314	0.3340	0.3368	1.3068
13	9.7080	0.3287	1.0639	1.2062	29	9.8336	0.3447	0.4439	1.3057
14	9.7123	0.3246	1.0540	1.2121	30	9.8353	0.3543	0.4926	1.3045
15	+9.7166	-0.3249	+1.0438	+1.2178	31	+9.8365	-0.3616	-0.5369	+1.3032
16	+9.7206	-0.3274	+1.0332	+1.2232	32	+9.8375	-0.3656	-0.5757	+1.3017

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .		
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Jan.	1	0.0050	-15.25	-1.017	172 42	11 30.8	349 8	23 16.5	+0.8242	+1.3091	-1.67	-0.2222	
	2	0.0077	15.05	1.003	172 27	11 29.8	348 12	23 12.8	0.8188	1.3088	1.81	0.2575	
	3	0.0105	14.83	0.989	172 17	11 29.1	347 16	23 9.1	0.8125	1.3085	1.95	0.2901	
	h (7.0)	4	0.0132	14.59	0.973	172 16	11 29.1	346 20	23 5.3	0.8056	1.3082	2.09	0.3203
	5	0.0160	14.36	0.958	172 25	11 29.7	345 23	23 1.5	0.7985	1.3079	2.23	0.3483	
	6	0.0187	-14.15	-0.943	172 45	11 31.0	344 26	22 57.7	+0.7917	+1.3076	-2.37	-0.3744	
	7	0.0214	13.98	0.932	173 12	11 32.8	343 29	22 53.9	0.7859	1.3073	2.51	0.3990	
	8	0.0242	13.84	0.923	173 42	11 34.8	342 32	22 50.1	0.7811	1.3069	2.65	0.4223	
	9	0.0269	13.74	0.916	174 10	11 36.7	341 34	22 46.3	0.7775	1.3065	2.78	0.4443	
	10	0.0297	13.65	0.910	174 32	11 38.1	340 37	22 42.5	0.7746	1.3061	2.91	0.4649	
	11	0.0324	-13.59	-0.906	174 45	11 39.0	339 39	22 38.6	+0.7723	+1.3057	-3.04	-0.4843	
	12	0.0351	13.51	0.901	174 48	11 39.2	338 42	22 34.8	0.7698	1.3053	3.18	0.5029	
	13	0.0379	13.41	0.894	174 41	11 38.7	337 44	22 30.9	0.7665	1.3048	3.31	0.5207	
	14	0.0406	13.27	0.885	174 28	11 37.9	336 46	22 27.1	0.7622	1.3043	3.45	0.5377	
	15	0.0434	13.09	0.873	174 14	11 36.9	335 48	22 23.2	0.7565	1.3038	3.58	0.5538	
	16	0.0461	-12.87	-0.858	174 4	11 36.3	334 50	22 19.3	+0.7494	+1.3033	-3.71	-0.5691	
	17	0.0488	12.64	0.843	174 2	11 36.1	333 52	22 15.5	0.7413	1.3028	3.84	0.5837	
	18	0.0516	12.39	0.826	174 10	11 36.7	332 54	22 11.6	0.7325	1.3023	3.97	0.5978	
	19	0.0543	12.15	0.809	174 32	11 38.1	331 56	22 7.7	0.7237	1.3018	4.10	0.6114	
	h (8.0)	20	0.0571	11.94	0.796	175 4	11 40.3	330 58	22 3.9	0.7156	1.3012	4.22	0.6245
	21	0.0598	-11.76	-0.784	175 44	11 42.9	329 59	21 59.9	+0.7087	+1.3006	-4.34	-0.6371	
	22	0.0625	11.63	0.775	176 25	11 45.7	329 0	21 56.0	0.7033	1.3000	4.46	0.6492	
	23	0.0652	11.53	0.769	177 2	11 48.1	328 1	21 52.1	0.6995	1.2994	4.58	0.6607	
	24	0.0680	11.46	0.764	177 30	11 50.0	327 2	21 48.1	0.6966	1.2988	4.70	0.6718	
	25	0.0707	11.41	0.761	177 45	11 51.0	326 3	21 44.2	0.6942	1.2982	4.82	0.6825	
	26	0.0734	-11.33	-0.755	177 47	11 51.1	325 4	21 40.3	+0.6917	+1.2976	-4.93	-0.6928	
	27	0.0761	11.24	0.749	177 41	11 50.7	324 4	21 36.3	0.6883	1.2970	5.04	0.7027	
	28	0.0789	11.12	0.741	177 30	11 50.0	323 4	21 32.3	0.6833	1.2964	5.15	0.7122	
	29	0.0816	10.95	0.730	177 21	11 49.4	322 5	21 28.3	0.6770	1.2958	5.26	0.7214	
	30	0.0844	10.76	0.717	177 30	11 49.3	321 5	21 24.3	0.6695	1.2951	5.37	0.7303	
	31	0.0871	-10.56	-0.704	177 30	11 50.0	320 5	21 20.3	+0.6611	+1.2944	-5.48	-0.7390	
Feb.	1	0.0898	10.36	0.691	177 55	11 51.7	319 5	21 16.3	0.6526	1.2938	5.58	0.7474	
	2	0.0926	10.18	0.679	178 35	11 54.3	318 4	21 12.3	0.6447	1.2931	5.69	0.7554	
	3	0.0953	10.02	0.668	179 25	11 57.7	317 4	21 8.3	0.6381	1.2925	5.79	0.7631	
	h (9.0)	4	0.0981	9.91	0.661	180 19	12 1.3	316 3	0.6331	1.2918	5.89	0.7705	
	5	0.1008	-9.84	-0.656	181 11	12 4.7	315 3	21 0.2	+0.6299	+1.2911	-5.99	-0.7776	
	6	0.1035	9.79	0.653	181 53	12 7.5	314 2	20 56.1	0.6280	1.2904	6.09	0.7845	
	7	0.1063	9.75	0.650	182 22	12 9.5	313 1	20 52.1	0.6265	1.2898	6.19	0.7912	
	8	0.1090	9.72	0.648	182 37	12 10.5	311 59	20 47.9	0.6249	1.2891	6.28	0.7977	
	9	0.1118	9.66	0.644	182 39	12 10.6	310 58	20 43.9	0.6224	1.2884	6.37	0.8039	
	10	0.1145	-9.57	-0.638	182 33	12 10.2	309 56	20 39.7	+0.6184	+1.2878	-6.46	-0.8099	
	11	0.1172	9.44	0.629	182 24	12 9.6	308 54	20 35.6	0.6125	1.2871	6.55	0.8157	
	12	0.1200	9.28	0.619	182 20	12 9.3	307 52	20 31.5	0.6048	1.2865	6.63	0.8213	
	13	0.1227	9.09	0.606	182 26	12 9.7	306 50	20 27.3	0.5956	1.2858	6.71	0.8267	
	14	0.1255	8.89	0.593	182 48	12 11.2	305 48	20 23.2	0.5859	1.2852	6.79	0.8318	
	15	0.1282	-8.67	-0.578	183 28	12 13.9	304 45	20 19.0	+0.5756	+1.2846	-6.87	-0.8367	
	16	0.1309	-8.48	-0.565	184 23	12 17.5	303 42	20 14.8	+0.5666	+1.2840	-6.95	-0.8415	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
Feb. 15	0.1282	-8.87	-0.578	183 28	12 13.9	304 45	20 19.0	+0.5756	+1.2846	-6.87	-0.8367
16	0.1309	8.48	0.565	184 23	12 17.5	303 42	20 14.8	0.5666	1.2840	6.95	0.8415
17	0.1337	8.34	0.556	185 25	12 21.7	302 39	20 10.6	0.5594	1.2834	7.02	0.8461
18	0.1364	8.23	0.549	186 35	12 26.3	301 36	20 6.4	0.5547	1.2828	7.09	0.8505
19	0.1392	8.16	0.544	187 35	12 30.3	300 33	20 2.2	0.5518	1.2822	7.16	0.8547
(10.0) 20	0.1419	-8.12	-0.541	188 20	12 33.3	299 30	19 58.0	+0.5505	+1.2817	-7.23	-0.8587
21	0.1446	8.09	0.539	188 46	12 35.1	298 27	19 53.8	0.5497	1.2811	7.29	0.8626
22	0.1474	8.07	0.538	188 58	12 35.7	297 23	19 49.5	0.5484	1.2806	7.35	0.8663
23	0.1501	8.02	0.535	188 53	12 35.5	296 19	19 45.3	0.5458	1.2800	7.41	0.8699
24	0.1529	7.95	0.530	188 42	12 34.8	295 15	19 41.0	0.5415	1.2795	7.47	0.8733
25	0.1556	-7.84	-0.523	188 32	12 34.1	294 11	19 36.7	+0.5352	+1.2790	-7.52	-0.8765
26	0.1583	7.69	0.513	188 32	12 34.1	293 7	19 32.5	0.5272	1.2785	7.57	0.8796
27	0.1611	7.52	0.502	188 48	12 35.2	292 3	19 28.2	0.5182	1.2780	7.62	0.8825
28	0.1638	7.36	0.491	189 23	12 37.5	290 59	19 23.9	0.5090	1.2776	7.67	0.8853
Mar. 1	0.1666	7.20	0.480	190 16	12 41.1	289 55	19 19.7	0.5006	1.2772	7.72	0.8879
2	0.1693	-7.07	-0.471	191 25	12 45.7	288 51	19 15.4	+0.4944	+1.2768	-7.76	-0.8903
3	0.1720	6.98	0.465	192 38	12 50.5	287 47	19 11.1	0.4904	1.2764	7.80	0.8926
4	0.1748	6.92	0.461	193 47	12 55.1	286 42	19 6.8	0.4889	1.2760	7.84	0.8947
5	0.1775	-6.90	0.460	194 41	12 58.7	285 38	19 2.5	0.4893	1.2756	7.88	0.8967
6	0.1803	6.89	0.459	195 16	13 1.1	284 33	18 58.2	0.4900	1.2753	7.92	0.8986
(11.0) 7	0.1830	-6.89	-0.459	195 31	13 2.1	283 28	18 53.9	+0.4904	+1.2750	-7.95	-0.9003
8	0.1857	6.87	0.458	195 27	13 1.8	282 23	18 49.5	0.4893	1.2747	7.98	0.9019
9	0.1884	6.83	0.455	195 13	13 0.9	281 18	18 45.2	0.4859	1.2744	8.01	0.9033
10	0.1912	6.74	0.449	194 57	12 59.8	280 13	18 40.9	0.4800	1.2742	8.03	0.9046
11	0.1939	6.62	0.441	194 47	12 59.1	279 8	18 36.5	0.4712	1.2740	8.05	0.9058
12	0.1966	-6.46	-0.431	194 53	12 59.5	278 3	18 32.2	+0.4606	+1.2738	-8.07	-0.9069
13	0.2093	6.28	0.419	195 20	13 1.3	276 58	18 27.9	0.4491	1.2737	8.08	0.9078
14	0.2021	6.09	0.406	196 11	13 4.7	275 53	18 23.5	0.4379	1.2735	8.10	0.9086
15	0.2048	5.92	0.395	197 21	13 9.4	274 48	18 19.1	0.4281	1.2734	8.11	0.9092
16	0.2076	5.78	0.385	198 44	13 14.9	273 43	18 14.9	0.4210	1.2733	8.12	0.9097
17	0.2103	-5.68	-0.379	200 6	13 20.4	272 38	18 10.5	+0.4168	+1.2732	-8.13	-0.9101
18	0.2130	5.62	0.375	201 15	13 25.0	271 33	18 6.2	0.4154	1.2732	8.13	0.9103
19	0.2158	5.59	0.373	202 4	13 28.3	270 28	18 1.9	0.4154	1.2732	8.13	0.9104
20	0.2185	5.58	0.372	202 28	13 29.9	269 23	17 57.5	0.4157	1.2732	8.13	0.9104
21	0.2213	5.57	0.371	202 27	13 29.8	268 18	17 53.2	0.4149	1.2732	8.13	0.9103
(12.0) 22	0.2240	-5.55	-0.370	202 10	13 28.7	267 14	17 48.9	+0.4122	+1.2732	-8.13	-0.9101
23	0.2267	5.50	0.367	201 43	13 26.9	266 9	17 44.6	0.4068	1.2733	8.12	0.9097
24	0.2295	5.41	0.361	201 18	13 25.2	265 4	17 40.3	0.3983	1.2734	8.11	0.9092
25	0.2322	5.29	0.353	201 7	13 24.5	263 59	17 35.9	0.3877	1.2735	8.10	0.9086
26	0.2350	5.14	0.343	201 16	13 25.1	262 55	17 31.7	0.3759	1.2736	8.09	0.9078
27	0.2377	-4.98	-0.332	201 52	13 27.5	261 51	17 27.4	+0.3641	+1.2738	-8.07	-0.9069
28	0.2404	4.82	0.321	202 54	13 31.6	260 46	17 23.1	0.3530	1.2740	8.05	0.9058
29	0.2432	4.69	0.313	204 15	13 37.0	259 42	17 18.8	0.3449	1.2742	8.03	0.9046
30	0.2459	4.58	0.305	205 41	13 42.7	258 38	17 14.5	0.3404	1.2744	8.00	0.9033
31	0.2487	4.52	0.301	206 59	13 47.9	257 34	17 10.3	0.3391	1.2747	7.98	0.9018
Apr. 1	0.2514	-4.49	-0.299	207 58	13 51.9	256 30	17 6.0	+0.3396	+1.2750	-7.95	-0.9002
2	0.2541	-4.48	-0.299	208 28	13 53.9	255 25	17 1.7	+0.3410	+1.2753	-7.92	-0.8985

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .		
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Apr.	y	$''$	$'''$	$'''$	$'''$	$'''$	$'''$			$''$			
	1	0.2514	-4.49	-0.299	207 58	13 51.9	256 30	17 6.0	+0.3396	+1.2750	-7.95	-0.9002	
	2	0.2541	4.48	0.299	208 28	13 53.9	255 25	17 1.7	0.3410	1.2753	7.92	0.8985	
	3	0.2569	4.48	0.299	208 31	13 54.1	254 21	16 57.4	0.3412	1.2756	7.89	0.8967	
	4	0.2596	4.47	0.297	208 11	13 52.7	253 17	16 53.1	0.3388	1.2759	7.85	0.8947	
	5	0.2624	4.43	0.295	207 39	13 50.6	252 13	16 48.9	0.3330	1.2763	7.81	0.8926	
	b (13.0)	6	0.2651	-4.36	-0.291	207 5	13 48.3	251 9	16 44.6	+0.3232	+1.2767	-7.77	-0.8904
	7	0.2678	4.24	0.283	206 41	13 46.7	250 6	16 40.4	0.3097	1.2771	7.73	0.8881	
	8	0.2706	4.08	0.272	206 40	13 46.7	249 3	16 36.2	0.2930	1.2775	7.68	0.8856	
	9	0.2733	3.89	0.259	207 14	13 48.9	248 0	16 32.0	0.2746	1.2779	7.63	0.8829	
	10	0.2761	3.70	0.247	208 22	13 53.5	246 58	16 27.9	0.2569	1.2784	7.58	0.8800	
	11	0.2788	-3.52	-0.235	210 2	14 0.1	245 56	16 23.7	+0.2411	+1.2789	-7.53	-0.8769	
	12	0.2815	3.35	0.223	212 2	14 8.1	244 54	16 19.6	0.2294	1.2794	7.48	0.8738	
	13	0.2843	3.22	0.215	214 3	14 16.2	243 52	16 15.5	0.2221	1.2799	7.42	0.8706	
	14	0.2870	3.14	0.209	215 46	14 23.1	242 50	16 11.3	0.2189	1.2804	7.36	0.8572	
	15	0.2898	3.08	0.205	216 54	14 27.6	241 49	16 7.3	0.2174	1.2809	7.30	0.8636	
	16	0.2925	-3.05	-0.203	217 25	14 29.7	240 48	16 3.2	+0.2158	+1.2814	-7.24	-0.8599	
	17	0.2952	3.03	0.202	217 21	14 29.4	239 47	15 59.1	0.2118	1.2819	7.17	0.8561	
	18	0.2980	2.99	0.199	216 53	14 27.5	238 46	15 55.1	0.2036	1.2825	7.10	0.8521	
	19	0.3007	2.93	0.195	216 14	14 24.9	237 45	15 51.0	0.1908	1.2831	7.03	0.8479	
	20	0.3035	2.83	0.189	215 41	14 22.7	236 44	15 46.9	0.1732	1.2837	6.96	0.8435	
	b (14.0)	21	0.3062	-2.70	-0.180	215 33	14 22.2	235 43	15 42.9	+0.1512	+1.2843	-6.89	-0.8399
	22	0.3089	2.53	0.169	216 6	14 24.4	234 43	15 38.9	0.1262	1.2849	6.82	0.8342	
	23	0.3117	2.35	0.157	217 30	14 30.0	233 43	15 34.9	0.1011	1.2855	6.74	0.8293	
	24	0.3144	2.17	0.145	219 46	14 39.1	232 43	15 30.9	0.0787	1.2861	6.66	0.8242	
	25	0.3172	2.00	0.133	222 39	14 50.6	231 43	15 26.9	0.0621	1.2867	6.58	0.8190	
	26	0.3199	-1.86	-0.124	225 43	15 2.9	230 43	15 22.9	+0.0527	+1.2874	-6.50	-0.8136	
	27	0.3226	1.76	0.118	228 29	15 13.9	229 44	15 18.9	0.0496	1.2880	6.42	0.8080	
	28	0.3253	1.69	0.113	230 30	15 22.0	228 45	15 15.0	0.0501	1.2886	6.34	0.8022	
	29	0.3281	1.65	0.110	231 42	15 26.8	227 46	15 11.1	0.0503	1.2893	6.25	0.7962	
30	0.3308	1.62	0.108	232 7	15 28.4	226 47	15 7.1	0.0468	1.2899	6.16	0.7899		
May	1	0.3335	-1.59	-0.106	232 5	15 28.3	225 48	15 3.2	+0.0372	+1.2905	-6.07	-0.7834	
	2	0.3362	1.53	0.102	231 55	15 27.7	224 50	14 59.3	0.0193	1.2911	5.98	0.7767	
	3	0.3390	1.44	0.096	232 4	15 28.3	223 52	14 55.5	9.9927	1.2918	5.89	0.7698	
	4	0.3417	1.31	0.087	233 0	15 32.0	222 54	14 51.6	9.9581	1.2924	5.79	0.7627	
	5	0.3445	1.13	0.075	235 24	15 41.6	221 56	14 47.7	9.9171	1.2931	5.69	0.7553	
	b (15.0)	6	0.3472	-0.92	-0.061	239 37	15 58.5	220 58	14 43.9	+9.8757	+1.2937	-5.59	-0.7477
	7	0.3499	0.70	0.047	245 58	16 23.9	220 0	14 40.0	9.8408	1.2943	5.49	0.7399	
	8	0.3527	0.47	0.031	253 47	16 55.1	219 3	14 36.2	9.8214	1.2950	5.39	0.7318	
	9	0.3554	0.27	0.018	261 42	17 26.8	218 6	14 32.4	9.8211	1.2956	5.29	0.7234	
	10	0.3582	-0.10	-0.007	268 17	17 53.1	217 9	14 28.6	9.8354	1.2962	5.19	0.7147	
	11	0.3609	+0.04	+0.003	273 7	18 12.5	216 12	14 24.8	+9.8550	+1.2968	-5.08	-0.7056	
	12	0.3636	0.14	0.009	276 19	18 25.3	215 16	14 21.1	9.8708	1.2974	4.97	0.6962	
	13	0.3664	0.21	0.013	279 37	18 34.5	214 20	14 17.3	9.8790	1.2980	4.86	0.6865	
	14	0.3691	0.27	0.018	280 39	18 42.6	213 24	14 13.6	9.8773	1.2986	4.75	0.6765	
	15	0.3719	0.34	0.023	283 15	18 53.0	212 28	14 9.9	9.8685	1.2992	4.64	0.6662	
	16	0.3746	+0.43	+0.029	287 1	19 8.1	211 32	14 6.1	+9.8496	+1.2997	-4.52	-0.6555	
	17	0.3773	+0.55	+0.037	292 24	19 29.6	210 36	14 2.4	+9.8326	+1.3003	-4.41	-0.6445	

FOR WASHINGTON MEAN MIDNIGHT.													
Solar Day. (Sid. Hour.)	τ	f		G		H		Log $g.$	Log $h.$	i	Log $i.$		
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
May	17	0.3773	+0.55	+0.037	292 24	19 29.6	210 36	14 2.4	+9.8326	+1.3003	-4.41	-0.6445	
	18	0.3801	0.70	0.047	299 23	19 57.5	209 40	13 58.7	9.8241	1.3009	4.30	0.6330	
	19	0.3828	0.89	0.059	307 6	20 23.4	208 45	13 55.0	9.8321	1.3014	4.18	0.6210	
	20	0.3856	1.11	0.074	314 10	20 56.7	207 50	13 51.3	9.8583	1.3019	4.06	0.6085	
	21	0.3883	1.33	0.089	319 27	21 17.8	206 55	13 47.7	9.8960	1.3024	3.94	0.5956	
	(16.0)	22	0.3910	+1.53	+0.102	322 46	21 31.1	206 0	13 44.0	+9.9371	+1.3029	-3.82	-0.5822
	23	0.3938	1.72	0.115	324 25	21 37.7	205 5	13 40.3	9.9755	1.3034	3.70	0.5682	
	24	0.3965	1.87	0.125	325 0	21 40.0	204 10	13 36.7	0.0076	1.3039	3.58	0.5536	
	25	0.3993	1.98	0.132	325 3	21 40.2	203 16	13 33.1	0.0319	1.3043	3.46	0.5384	
	26	0.4020	2.06	0.137	325 4	21 40.3	202 22	13 29.5	0.0485	1.3047	3.33	0.5226	
	27	0.4047	+2.12	+0.141	325 30	21 42.0	201 28	13 25.9	+0.0590	+1.3051	-3.21	-0.5062	
June	28	0.4075	2.18	0.145	326 38	21 46.4	200 34	13 22.3	0.0654	1.3055	3.09	0.4889	
	29	0.4102	2.26	0.151	328 34	21 54.3	199 40	13 18.7	0.0708	1.3059	2.96	0.4706	
	30	0.4130	2.37	0.158	331 21	22 5.4	198 46	13 15.1	0.0790	1.3063	2.83	0.4513	
	31	0.4157	2.52	0.169	334 34	22 18.3	197 53	13 11.5	0.0929	1.3067	2.70	0.4311	
	1	0.4184	+2.71	+0.181	337 46	22 31.1	196 59	13 7.9	+0.1137	+1.3071	-2.57	-0.4100	
	2	0.4212	2.94	0.196	340 28	22 41.9	196 6	13 4.4	0.1403	1.3075	2.44	0.3875	
	3	0.4239	3.19	0.213	342 20	22 49.3	195 12	13 0.8	0.1706	1.3078	2.31	0.3636	
	4	0.4267	3.45	0.230	343 19	22 53.3	194 19	12 57.3	0.2011	1.3081	2.18	0.3382	
	5	0.4294	3.69	0.246	343 35	22 54.3	193 26	12 53.7	0.2297	1.3084	2.05	0.3114	
	(17.0)	6	0.4321	+3.90	+0.260	343 18	22 53.2	192 33	12 50.2	+0.2538	+1.3087	-1.92	-0.2826
	7	0.4349	4.08	0.272	342 47	22 51.1	191 40	12 46.7	0.2739	1.3090	1.78	0.2515	
July	8	0.4376	4.21	0.281	342 15	22 49.0	190 47	12 43.1	0.2893	1.3092	1.65	0.2179	
	9	0.4404	4.32	0.288	341 57	22 47.8	189 54	12 39.6	0.3007	1.3094	1.51	0.1813	
	10	0.4431	4.40	0.293	342 1	22 48.1	189 1	12 36.1	0.3091	1.3096	1.38	0.1412	
	11	0.4458	+4.49	+0.299	342 34	22 50.3	188 8	12 32.5	+0.3162	+1.3098	-1.25	-0.0970	
	12	0.4485	4.59	0.306	343 32	22 54.1	187 15	12 29.0	0.3238	1.3100	1.11	0.0476	
	13	0.4513	4.73	0.315	344 50	22 59.3	186 22	12 25.5	0.3331	1.3101	0.98	9.9917	
	14	0.4540	4.90	0.327	346 14	23 4.9	185 29	12 21.9	0.3454	1.3102	0.84	9.9273	
	15	0.4567	5.09	0.339	347 28	23 9.9	184 37	12 18.5	0.3605	1.3103	0.71	9.8514	
	16	0.4594	+5.32	+0.355	348 22	23 13.5	183 44	12 14.9	+0.3776	+1.3104	-0.58	-9.7592	
	17	0.4622	5.56	0.371	348 49	23 15.3	182 52	12 11.5	0.3959	1.3104	0.44	9.6412	
	18	0.4649	5.79	0.386	348 48	23 15.2	181 59	12 7.9	0.4135	1.3105	0.31	9.4770	
(18.0)	19	0.4677	6.00	0.400	348 26	23 13.7	181 7	12 4.5	0.4295	1.3105	0.17	9.1988	
	20	0.4704	6.18	0.412	347 48	23 11.1	180 14	12 0.9	0.4429	1.3106	-0.04	-8.5647	
	21	0.4731	+6.32	+0.421	347 7	23 8.4	179 22	11 57.5	+0.4538	+1.3106	+0.09	+8.8649	
	22	0.4759	6.42	0.428	346 29	23 5.9	178 29	11 53.9	0.4617	1.3106	0.23	9.3509	
	23	0.4786	6.50	0.433	346 6	23 4.4	177 37	11 50.5	0.4677	1.3105	0.36	9.5602	
	24	0.4814	6.57	0.438	346 1	23 4.1	176 44	11 46.9	0.4726	1.3105	0.50	9.6991	
	25	0.4841	6.65	0.443	346 17	23 5.1	175 52	11 43.5	0.4774	1.3104	0.64	9.8037	
	26	0.4868	+6.76	+0.451	346 52	23 7.5	174 59	11 39.9	+0.4831	+1.3103	+0.77	+9.8876	
	27	0.4896	6.90	0.460	347 36	23 10.4	174 7	11 36.5	0.4908	1.3102	0.91	9.9576	
	28	0.4923	7.09	0.473	348 23	23 13.5	173 14	11 32.9	0.5011	1.3101	1.04	0.0178	
	29	0.4951	7.31	0.487	349 2	23 16.1	172 22	11 29.5	0.5136	1.3099	1.18	0.0705	
30	0.4978	7.56	0.504	349 26	23 17.7	171 29	11 25.9	0.5275	1.3097	1.31	0.1174		
July	1	0.5005	+7.82	+0.521	349 30	23 18.0	170 36	11 22.4	+0.5417	+1.3095	+1.45	+0.1595	
	2	0.5033	+8.07	+0.538	349 17	23 17.1	169 44	11 18.9	+0.5557	+1.3093	+1.58	+0.1978	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Std. Hour.)	τ	f		G		H		Log g .	Log λ .	i	Log i .	
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
July	1	0.5005	+ 7.82	+0.521	349 30	23 18.0	170 36	11 22.4	+0.5417	+1.3095	+1.45	+0.1595
	2	0.5033	8.07	0.538	349 17	23 17.1	169 44	11 18.9	0.5557	1.3093	1.58	0.1978
	3	0.5060	8.30	0.553	348 49	23 15.3	168 51	11 15.4	0.5682	1.3091	1.71	0.2329
	4	0.5088	8.49	0.566	348 12	23 12.8	167 58	11 11.9	0.5789	1.3089	1.84	0.2653
	5	0.5115	8.64	0.576	347 37	23 10.5	167 5	11 8.3	0.5873	1.3086	1.97	0.2953
	6	0.5142	+ 8.76	+0.584	347 8	23 8.5	166 12	11 4.8	+0.5940	+1.3083	+2.10	+0.3233
	(19.0) 7	0.5170	8.84	0.589	346 48	23 7.2	165 19	11 1.3	0.5987	1.3080	2.23	0.3494
	8	0.5197	8.92	0.595	346 44	23 6.9	164 26	10 57.7	0.6028	1.3077	2.36	0.3739
	9	0.5225	9.02	0.601	346 55	23 7.7	163 33	10 54.2	0.6070	1.3074	2.49	0.3971
	10	0.5252	9.14	0.609	347 17	23 9.1	162 39	10 50.6	0.6120	1.3070	2.62	0.4189
	11	0.5279	+ 9.28	+0.619	347 45	23 11.0	161 45	10 47.0	+0.6181	+1.3066	+2.75	+0.4396
	12	0.5307	9.47	0.631	348 13	23 12.9	160 52	10 43.5	0.6258	1.3062	2.88	0.4592
	13	0.5334	9.68	0.645	348 33	23 14.2	159 59	10 39.9	0.6349	1.3058	3.01	0.4779
	14	0.5362	9.90	0.660	348 40	23 14.7	159 5	10 36.3	0.6448	1.3054	3.14	0.4957
	15	0.5389	10.13	0.675	348 32	23 14.1	158 11	10 32.7	0.6547	1.3050	3.26	0.5126
	16	0.5416	+10.33	+0.689	348 12	23 12.8	157 17	10 29.1	+0.6639	+1.3046	+3.39	+0.5287
	17	0.5444	10.51	0.701	347 41	23 10.7	156 23	10 25.5	0.6720	1.3042	3.51	0.5442
	18	0.5471	10.65	0.710	347 6	23 8.4	155 29	10 21.9	0.6786	1.3037	3.63	0.5591
	19	0.5499	10.74	0.716	346 31	23 6.1	154 34	10 18.3	0.6834	1.3032	3.75	0.5734
	20	0.5526	10.81	0.721	346 3	23 4.2	153 39	10 14.6	0.6871	1.3027	3.87	0.5871
	21	0.5553	+10.86	+0.724	345 46	23 3.1	152 45	10 11.0	+0.6897	+1.3022	+3.99	+0.6001
	(20.0) 22	0.5581	10.92	0.728	345 40	23 2.7	151 50	10 7.3	0.6922	1.3017	4.11	0.6127
	23	0.5608	11.00	0.733	345 47	23 3.1	150 55	10 3.7	0.6950	1.3012	4.23	0.6249
	24	0.5636	11.11	0.741	346 3	23 4.2	150 0	10 0.0	0.6988	1.3006	4.34	0.6367
	25	0.5663	11.27	0.751	346 24	23 5.6	149 5	9 56.3	0.7042	1.3000	4.45	0.6481
	26	0.5690	+11.45	+0.763	346 44	23 6.9	148 10	9 52.7	+0.7109	+1.2995	+4.56	+0.6591
	27	0.5718	11.67	0.778	346 57	23 7.8	147 15	9 49.0	0.7187	1.2990	4.67	0.6697
	28	0.5745	11.91	0.794	346 59	23 7.9	146 20	9 45.3	0.7271	1.2984	4.78	0.6799
	29	0.5773	12.13	0.809	346 50	23 7.3	145 24	9 41.6	0.7357	1.2978	4.89	0.6897
	30	0.5800	12.35	0.823	346 30	23 6.0	144 28	9 37.9	0.7437	1.2972	5.00	0.6990
Aug.	31	0.5827	+12.52	+0.835	346 3	23 4.2	143 32	9 34.1	+0.7506	+1.2966	+5.11	+0.7080
	1	0.5854	12.66	0.844	345 32	23 2.1	142 36	9 30.4	0.7562	1.2960	5.22	0.7168
	2	0.5882	12.75	0.850	345 4	23 0.3	141 40	9 26.7	0.7604	1.2954	5.32	0.7254
	3	0.5909	12.82	0.855	344 42	22 58.8	140 43	9 22.9	0.7636	1.2948	5.42	0.7338
	4	0.5936	12.87	0.858	344 29	22 57.9	139 46	9 19.1	0.7658	1.2942	5.52	0.7419
	5	0.5963	+12.93	+0.862	344 28	22 57.9	138 49	9 15.3	+0.7679	+1.2936	+5.62	+0.7496
	(21.0) 6	0.5991	13.01	0.867	344 36	22 58.4	137 52	9 11.5	0.7702	1.2930	5.72	0.7571
	7	0.6018	13.12	0.875	344 50	22 59.3	136 55	9 7.7	0.7733	1.2923	5.82	0.7643
	8	0.6046	13.26	0.884	345 6	23 0.4	135 57	9 3.8	0.7774	1.2916	5.91	0.7713
	9	0.6073	13.44	0.896	345 20	23 1.3	134 59	8 59.9	0.7827	1.2910	6.00	0.7781
	10	0.6100	+13.63	+0.909	345 26	23 1.7	134 1	8 56.1	+0.7887	+1.2904	+6.09	+0.7846
	11	0.6128	13.83	0.922	345 22	23 1.5	133 3	8 52.2	0.7949	1.2897	6.18	0.7909
	12	0.6155	14.01	0.934	345 9	23 0.6	132 5	8 48.3	0.8010	1.2891	6.27	0.7970
	13	0.6183	14.17	0.945	344 47	22 59.1	131 6	8 44.4	0.8065	1.2885	6.36	0.8030
	14	0.6210	14.28	0.952	344 21	22 57.4	130 7	8 40.5	0.8110	1.2879	6.44	0.8088
	15	0.6237	+14.36	+0.957	343 53	22 55.5	129 8	8 36.5	+0.8143	+1.2872	+6.52	+0.8143
16	0.6265	+14.40	+0.960	343 28	22 53.9	128 9	8 32.6	+0.8164	+1.2866	+6.60	+0.8196	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Std. Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .		
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	$''$	$'''$	$''$	$'''$	$''$	$'''$			$''$			
Aug.	16	0.6265	+14.40	+0.960	343 28	22 53.9	128 9	8 32.6	+0.8164	+1.2866	+6.60	+0.8196	
	17	0.6292	14.42	0.961	343 10	22 52.7	127 10	8 28.7	0.8178	1.2860	6.68	0.8248	
	18	0.6320	14.44	0.963	343 1	22 52.1	126 10	8 24.7	0.8188	1.2854	6.76	0.8298	
	19	0.6347	14.48	0.965	343 2	22 52.1	125 11	8 20.7	0.8198	1.2848	6.84	0.8346	
	20	0.6374	14.54	0.969	343 11	22 52.7	124 11	8 16.7	0.8214	1.2842	6.91	0.8392	
	(22.0)	21	0.6402	+14.65	+0.977	343 26	22 53.7	123 11	8 12.7	+0.8239	+1.2836	+6.98	+0.8437
	22	0.6429	14.79	0.986	343 41	22 54.7	122 11	8 8.7	0.8276	1.2831	7.05	0.8480	
	23	0.6457	14.97	0.998	343 53	22 55.5	121 11	8 4.7	0.8323	1.2825	7.12	0.8522	
	24	0.6484	15.17	1.011	343 58	22 55.9	120 11	8 0.7	0.8378	1.2820	7.18	0.8562	
	25	0.6511	15.36	1.024	343 55	22 55.7	119 10	7 56.7	0.8436	1.2814	7.24	0.8600	
	26	0.6539	+15.55	+1.037	343 44	22 54.9	118 9	7 52.6	+0.8491	+1.2809	+7.30	+0.8636	
	27	0.6566	15.71	1.047	343 26	22 53.7	117 8	7 48.5	0.8542	1.2804	7.36	0.8671	
	28	0.6594	15.82	1.055	343 4	22 52.3	116 7	7 44.4	0.8582	1.2799	7.42	0.8705	
	29	0.6621	15.89	1.059	342 42	22 50.8	115 5	7 40.3	0.8611	1.2794	7.48	0.8738	
	30	0.6648	15.94	1.063	342 24	22 49.6	114 4	7 36.3	0.8630	1.2789	7.53	0.8770	
	31	0.6676	+15.97	+1.065	342 13	22 48.9	113 2	7 32.1	+0.8642	+1.2784	+7.58	+0.8800	
	Sept.	1	0.6703	15.99	1.066	342 11	22 48.7	112 0	7 28.0	0.8649	1.2780	7.63	0.8828
		2	0.6731	16.03	1.069	342 17	22 49.1	110 58	7 23.9	0.8658	1.2776	7.68	0.8854
		3	0.6758	16.10	1.073	342 29	22 49.9	109 56	7 19.7	0.8672	1.2772	7.72	0.8878
		4	0.6785	16.21	1.081	342 45	22 51.0	108 54	7 15.6	0.8694	1.2768	7.76	0.8901
(23.0)	5	0.6813	+16.35	+1.090	343 0	22 52.0	107 52	7 11.5	+0.8724	+1.2764	+7.80	+0.8923	
	6	0.6840	16.50	1.100	343 10	22 52.7	106 49	7 7.3	0.8762	1.2760	7.84	0.8944	
	7	0.6868	16.67	1.111	343 14	22 52.9	105 46	7 3.1	0.8805	1.2757	7.88	0.8964	
	8	0.6895	16.84	1.123	343 10	22 52.7	104 43	6 58.9	0.8848	1.2754	7.91	0.8983	
	9	0.6922	16.97	1.132	342 58	22 51.9	103 40	6 54.7	0.8888	1.2751	7.94	0.9001	
	10	0.6950	+17.08	+1.139	342 42	22 50.8	102 37	6 50.5	+0.8921	+1.2748	+7.97	+0.9017	
	11	0.6977	17.14	1.143	342 22	22 49.5	101 34	6 46.3	0.8945	1.2746	8.00	0.9032	
	12	0.7005	17.17	1.145	342 4	22 48.3	100 31	6 42.1	0.8959	1.2743	8.02	0.9045	
	13	0.7032	17.18	1.145	341 50	22 47.3	99 27	6 37.8	0.8965	1.2741	8.04	0.9056	
	14	0.7059	17.18	1.145	341 44	22 46.9	98 24	6 33.6	0.8968	1.2739	8.06	0.9066	
	15	0.7086	+17.18	+1.145	341 46	22 47.1	97 20	6 29.3	+0.8968	+1.2737	+8.08	+0.9075	
	16	0.7114	17.21	1.147	341 56	22 47.7	96 16	6 25.1	0.8973	1.2736	8.10	0.9083	
	17	0.7141	17.28	1.152	342 12	22 48.8	95 12	6 20.8	0.8983	1.2734	8.11	0.9090	
	18	0.7168	17.39	1.159	342 30	22 50.0	94 8	6 16.5	0.9003	1.2733	8.12	0.9096	
	19	0.7195	17.54	1.169	342 47	22 51.1	93 4	6 12.3	0.9035	1.2733	8.12	0.9101	
	(24.0)	20	0.7223	+17.71	+1.181	342 59	22 51.9	92 0	6 8.0	+0.9072	+1.2733	+8.12	+0.9104
	21	0.7250	17.90	1.193	343 4	22 52.3	90 56	6 3.7	0.9115	1.2732	8.13	0.9108	
	22	0.7278	18.07	1.205	343 2	22 52.1	89 52	5 59.5	0.9158	1.2732	8.13	0.9106	
	23	0.7305	18.22	1.215	342 54	22 51.6	88 48	5 55.2	0.9197	1.2732	8.13	0.9105	
	24	0.7332	18.34	1.223	342 41	22 50.7	87 44	5 50.9	0.9229	1.2733	8.12	0.9103	
	25	0.7360	+18.41	+1.227	342 28	22 49.9	86 40	5 46.7	+0.9253	+1.2734	+8.12	+0.9100	
	26	0.7387	18.45	1.230	342 17	22 49.1	85 36	5 42.4	0.9267	1.2734	8.11	0.9095	
	27	0.7415	18.47	1.231	342 11	22 48.7	84 32	5 38.1	0.9274	1.2735	8.10	0.9089	
	28	0.7442	18.49	1.233	342 12	22 48.8	83 27	5 33.8	0.9278	1.2736	8.09	0.9081	
	29	0.7469	18.52	1.235	342 21	22 49.4	82 23	5 29.5	0.9280	1.2738	8.07	0.9072	
	30	0.7497	+18.57	+1.238	342 36	22 50.4	81 19	5 25.3	+0.9287	+1.2740	+8.05	+0.9062	
	Oct.	1	0.7524	+18.67	+1.245	342 55	22 51.7	80 15	5 21.0	+0.9301	+1.2742	+8.03	+0.9051

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .	
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
Oct.	y	h	o	h	m	o	h					
	1	0.7521	+18.67	+1.245	342 55	22 51.7	80 15	5 21.0	+0.9301	+1.2742	+8.03	+0.9051
	2	0.7552	18.79	1.253	343 15	22 53.0	79 11	5 16.7	0.9322	1.2744	8.01	0.9039
	3	0.7579	18.93	1.262	343 32	22 54.1	78 7	5 12.5	0.9349	1.2746	7.99	0.9026
	4	0.7606	19.10	1.273	343 44	22 54.9	77 3	5 8.2	0.9383	1.2749	7.96	0.9011
	5	0.7634	19.27	1.285	343 48	22 55.2	75 59	5 3.9	0.9420	1.2752	7.93	0.8995
	(1.0) 6	0.7661	+19.41	+1.294	343 46	22 55.1	74 55	4 59.7	+0.9454	+1.2755	+7.90	+0.8977
	7	0.7689	19.52	1.301	343 38	22 54.6	73 51	4 55.4	0.9483	1.2758	7.87	0.8957
	8	0.7716	19.60	1.307	343 28	22 53.9	72 47	4 51.1	0.9503	1.2762	7.83	0.8936
	9	0.7743	19.65	1.310	343 17	22 53.1	71 43	4 46.9	0.9517	1.2766	7.79	0.8916
	10	0.7771	19.66	1.311	343 10	22 52.7	70 39	4 42.6	0.9523	1.2770	7.75	0.8893
	11	0.7798	+19.67	+1.312	343 9	22 52.6	69 35	4 38.3	+0.9525	+1.2774	+7.71	+0.8868
	12	0.7826	19.68	1.312	343 15	22 53.0	68 32	4 34.1	0.9524	1.2778	7.66	0.8841
	13	0.7853	19.70	1.313	343 29	22 53.9	67 29	4 29.9	0.9525	1.2782	7.61	0.8812
	14	0.7880	19.77	1.318	343 47	22 55.1	66 25	4 25.6	0.9532	1.2787	7.56	0.8782
	15	0.7908	19.89	1.326	344 9	22 56.6	65 22	4 21.5	0.9549	1.2792	7.51	0.8751
	16	0.7935	+20.03	+1.335	344 30	22 58.0	64 19	4 17.3	+0.9575	+1.2797	+7.45	+0.8719
	17	0.7963	20.21	1.347	344 48	22 59.2	63 16	4 13.1	0.9608	1.2802	7.39	0.8685
	18	0.7990	20.41	1.361	345 1	23 0.1	62 13	4 8.9	0.9645	1.2807	7.33	0.8650
	19	0.8017	20.60	1.373	345 6	23 0.4	61 10	4 4.7	0.9686	1.2812	7.27	0.8613
	20	0.8045	20.78	1.385	345 5	23 0.3	60 7	4 0.5	0.9723	1.2817	7.20	0.8574
	(2.0) 21	0.8072	+20.93	+1.395	345 0	23 0.0	59 5	3 56.3	+0.9755	+1.2823	+7.13	+0.8533
	22	0.8100	21.04	1.403	344 54	22 59.6	58 3	3 52.2	0.9780	1.2829	7.06	0.8491
	23	0.8127	21.11	1.407	344 49	22 59.3	57 1	3 48.1	0.9796	1.2835	6.99	0.8447
	24	0.8154	21.16	1.411	344 47	22 59.1	55 59	3 43.9	0.9807	1.2841	6.92	0.8401
	25	0.8182	21.20	1.413	344 52	22 59.5	54 57	3 39.8	0.9814	1.2847	6.84	0.8353
	26	0.8209	+21.25	+1.417	345 3	23 0.2	53 55	3 35.7	+0.9820	+1.2853	+6.76	+0.8303
	27	0.8237	21.32	1.421	345 20	23 1.3	52 53	3 31.5	0.9828	1.2859	6.68	0.8251
	28	0.8264	21.42	1.428	345 41	23 2.7	51 52	3 27.5	0.9841	1.2866	6.60	0.8198
	29	0.8291	21.56	1.437	346 3	23 4.2	50 50	3 23.3	0.9862	1.2872	6.52	0.8142
30	0.8319	21.73	1.449	346 24	23 5.6	49 49	3 19.3	0.9891	1.2879	6.43	0.8084	
Nov.	31	0.8346	+21.93	+1.462	346 40	23 6.7	48 48	3 15.2	+0.9925	+1.2885	+6.34	+0.8024
	1	0.8374	22.13	1.475	346 49	23 7.3	47 47	3 11.1	0.9960	1.2892	6.25	0.7962
	2	0.8401	22.31	1.487	346 53	23 7.5	46 46	3 7.1	0.9986	1.2899	6.16	0.7899
	3	0.8428	22.47	1.498	346 51	23 7.4	45 46	3 3.1	1.0028	1.2906	6.07	0.7832
	4	0.8455	22.60	1.507	346 45	23 7.0	44 45	2 59.0	1.0053	1.2912	5.98	0.7762
	(3.0) 5	0.8483	+22.69	+1.513	346 39	23 6.6	43 45	2 55.0	+1.0072	+1.2919	+5.89	+0.7690
	6	0.8510	22.74	1.516	346 36	23 6.4	42 45	2 51.0	1.0084	1.2925	5.78	0.7616
	7	0.8537	22.78	1.519	346 36	23 6.4	41 45	2 47.0	1.0091	1.2932	5.68	0.7540
	8	0.8564	22.82	1.521	346 43	23 6.9	40 45	2 43.0	1.0096	1.2938	5.58	0.7460
	9	0.8592	22.88	1.525	346 56	23 7.7	39 46	2 39.1	1.0103	1.2945	5.47	0.7377
	10	0.8619	+22.96	+1.531	347 14	23 8.9	38 46	2 35.1	+1.0115	+1.2951	+5.36	+0.7291
	11	0.8647	23.10	1.540	347 35	23 10.3	37 47	2 31.1	1.0134	1.2958	5.25	0.7202
	12	0.8674	23.27	1.551	347 56	23 11.7	36 47	2 27.1	1.0160	1.2964	5.14	0.7111
	13	0.8701	23.48	1.565	348 14	23 12.9	35 48	2 23.2	1.0194	1.2971	5.03	0.7015
	14	0.8729	23.71	1.581	348 28	23 13.9	34 49	2 19.3	1.0234	1.2977	4.92	0.6915
	15	0.8756	+23.95	+1.597	348 35	23 14.3	33 50	2 15.3	+1.0275	+1.2983	+4.80	+0.6812
	16	0.8784	+24.18	+1.612	348 36	23 14.4	32 51	2 11.4	+1.0315	+1.2989	+4.69	+0.6706

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ			G		H		Log g.	Log h.	i	Log i.	
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
Nov.	y	"	"	o	h m	s	h m			"		
	16	0.8784	+24.18	+1.612	348 36	23 14.4	32 51	2 11.4	+1.0315	+1.2989	+4.69	+0.6706
	17	0.8811	24.38	1.625	348 33	23 14.2	31 53	2 7.5	1.0350	1.2995	4.57	0.6596
	18	0.8838	24.54	1.636	348 28	23 13.9	30 54	2 3.6	1.0380	1.3001	4.45	0.6481
	19	0.8866	24.65	1.643	348 23	23 13.5	29 56	1 59.7	1.0402	1.3006	4.33	0.6361
	(d.o) 20	0.8893	24.75	1.650	348 21	23 13.4	28 58	1 55.9	1.0419	1.3012	4.21	0.6236
	21	0.8921	+24.83	+1.655	348 24	23 13.6	28 0	1 52.0	+1.0432	+1.3017	+4.09	+0.6107
	22	0.8948	24.92	1.661	348 33	23 14.2	27 2	1 48.1	1.0445	1.3023	3.96	0.5973
	23	0.8975	25.01	1.667	348 46	23 15.1	26 4	1 44.3	1.0459	1.3028	3.83	0.5833
	24	0.9003	25.15	1.677	349 3	23 16.2	25 6	1 40.4	1.0477	1.3033	3.70	0.5686
	25	0.9030	25.31	1.687	349 22	23 17.5	24 8	1 36.5	1.0501	1.3038	3.57	0.5532
	26	0.9058	+25.52	+1.701	349 39	23 18.6	23 11	1 32.7	+1.0532	+1.3043	+3.44	+0.5371
	27	0.9085	25.74	1.716	349 53	23 19.5	22 14	1 28.9	1.0567	1.3048	3.31	0.5202
	28	0.9112	25.98	1.732	350 1	23 20.1	21 17	1 25.1	1.0605	1.3053	3.18	0.5025
	29	0.9140	26.21	1.747	350 4	23 20.3	20 20	1 21.3	1.0643	1.3057	3.04	0.4839
30	0.9167	26.41	1.761	350 1	23 20.1	19 23	1 17.5	1.0677	1.3061	2.91	0.4643	
Dec.	1	0.9195	+26.59	+1.773	349 55	23 19.7	18 26	1 13.7	+1.0708	+1.3065	+2.77	+0.4437
	2	0.9222	26.73	1.782	349 48	23 19.2	17 29	1 9.9	1.0731	1.3069	2.64	0.4221
	3	0.9249	26.82	1.788	349 42	23 18.8	16 32	1 6.1	1.0749	1.3073	2.51	0.3991
	4	0.9277	26.91	1.794	349 39	23 18.6	15 35	1 2.3	1.0761	1.3076	2.37	0.3745
	(d.o) 5	0.9304	26.98	1.799	349 41	23 18.7	14 39	0 58.6	1.0773	1.3080	2.23	0.3482
	6	0.9332	+27.05	+1.803	349 49	23 19.3	13 43	0 54.9	+1.0784	+1.3083	+2.09	+0.3202
	7	0.9359	27.16	1.811	350 1	23 20.1	12 46	0 51.1	1.0798	1.3086	1.95	0.2902
	8	0.9386	27.31	1.821	350 15	23 21.0	11 49	0 47.3	1.0819	1.3089	1.81	0.2578
	9	0.9414	27.50	1.833	350 30	23 22.0	10 53	0 43.5	1.0846	1.3091	1.67	0.2225
	10	0.9441	27.73	1.849	350 43	23 22.9	9 57	0 39.8	1.0880	1.3094	1.53	0.1839
	11	0.9469	+27.99	+1.866	350 52	23 23.5	9 1	0 36.1	+1.0917	+1.3096	+1.39	+0.1415
	12	0.9496	28.26	1.884	350 55	23 23.7	8 5	0 32.3	1.0958	1.3098	1.24	0.0943
	13	0.9523	28.51	1.901	350 54	23 23.6	7 8	0 28.5	1.0997	1.3099	1.10	0.0410
	14	0.9551	28.74	1.916	350 48	23 23.2	6 12	0 24.8	1.1033	1.3101	0.96	9.9800
	15	0.9578	28.94	1.929	350 40	23 22.7	5 16	0 21.1	1.1065	1.3102	0.81	9.9090
	16	0.9606	+29.10	+1.940	350 32	23 22.1	4 20	0 17.3	+1.1091	+1.3103	+0.67	+9.8237
	17	0.9633	29.22	1.948	350 26	23 21.7	3 24	0 13.6	1.1110	1.3104	0.52	9.7169
	18	0.9660	29.33	1.955	350 23	23 21.5	2 28	0 9.9	1.1126	1.3104	0.38	9.5736
	19	0.9687	29.43	1.962	350 25	23 21.7	1 32	0 6.1	1.1141	1.3105	0.23	9.3528
	(d.o) 20	0.9715	29.54	1.969	350 31	23 22.1	0 36	0 2.5	1.1156	1.3105	+0.09	+9.9666
	21	0.9742	+29.68	+1.979	350 41	23 22.7	359 40	23 58.7	+1.1175	+1.3106	-0.05	-8.7185
	22	0.9769	29.85	1.990	350 52	23 23.5	358 44	23 54.9	1.1197	1.3106	0.19	9.2655
	23	0.9796	30.07	2.005	351 3	23 24.2	357 48	23 51.2	1.1226	1.3105	0.33	9.5241
	24	0.9824	30.31	2.021	351 11	23 24.7	356 52	23 47.5	1.1259	1.3104	0.48	9.6821
	25	0.9851	30.55	2.037	351 15	23 25.0	355 56	23 43.7	1.1293	1.3103	0.63	9.7970
	26	0.9879	+30.80	+2.053	351 14	23 24.9	355 0	23 40.0	+1.1328	+1.3102	-0.77	-9.8873
	27	0.9906	31.03	2.069	351 8	23 24.5	354 3	23 36.2	1.1361	1.3101	0.92	9.9619
	28	0.9933	31.22	2.081	350 59	23 23.9	353 7	23 32.5	1.1390	1.3100	1.06	0.0253
	29	0.9961	31.39	2.093	350 49	23 23.3	352 11	23 28.7	1.1414	1.3098	1.21	0.0806
	30	0.9988	31.50	2.100	350 39	23 22.6	351 14	23 24.9	1.1433	1.3096	1.35	0.1294
	31	1.0016	+31.59	+2.106	350 31	23 22.1	350 18	23 21.2	+1.1447	+1.3094	-1.49	-0.1732
	32	1.0043	+31.67	+2.111	350 27	23 21.8	349 21	23 17.4	+1.1458	+1.3092	-1.63	-0.2128

MEAN PLACES FOR 1890.0. (January 0^d.0—0^d.320, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
α Andromedæ	2.1	^h 0 ^m 2 42.116 ^s	+ 3.0915	+ 28° 28' 59.08"	+ 19.885
β Cassiopeæ	2.4	0 3 18.596	3.1744	+ 58 32 33.81	19.852
γ Andromedæ	4.9	0 4 36.279	3.1024	+ 45 27 35.69	20.035
δ Draconis (H.) S. P.	5.1	0 7 2.791	2.8853	+ 101 46 21.02	20.022
γ Pegasi (<i>Algenib</i>)	2.8	0 7 34.288	3.0837	+ 14 34 19.05	20.023
σ Andromedæ	4.4	0 12 34.919	+ 3.1231	+ 36 10 30.94	+ 19.983
ϵ Ceti	3.6	0 13 49.228	3.0528	— 9 26 2.51	19.957
δ Ursæ Minoris S. P.	6.2	0 14 20.390	0.1610	+ 91 41 24.57	19.940
δ Piscium	5.8	0 19 45.810	3.0732	+ 1 19 49.63	19.952
β Hydri	2.8	0 19 57.546	3.2304	— 77 52 25.80	20.284
η Ceti	6.0	0 24 25.488	+ 3.0611	— 4 33 54.47	+ 19.938
κ Draconis S. P.	3.8	0 28 47.225	2.5916	+ 109 36 19.56	19.889
π Andromedæ	4.4	0 31 0.336	3.1907	+ 33 6 49.15	19.671
α Cassiopeæ (<i>var.</i>)	2.3	0 34 16.050	3.3741	+ 55 56 2.03	19.788
β Ceti	2.2	0 38 4.092	3.0142	— 18 35 26.12	19.801
δ Cassiopeæ	5.7	0 38 23.220	+ 3.8585	+ 74 23 12.07	+ 19.752
ϵ Cassiopeæ	4.7	0 38 35.745	3.3194	+ 47 40 55.75	19.755
δ Piscium	4.8	0 42 58.489	3.1074	+ 6 59 10.47	19.649
γ Camelop. (H.) S. P.	5.2	0 48 19.458	0.3939	+ 95 59 21.24	19.596
γ Cassiopeæ	2.3	0 50 4.280	3.5794	+ 60 7 14.96	19.563
μ Andromedæ	4.0	0 50 38.855	+ 3.3113	+ 37 54 9.49	+ 19.617
δ Cephei (H.)	4.6	0 53 48.198	7.2427	+ 85 40 0.00	19.502
ϵ Piscium	4.3	0 57 14.039	3.1091	+ 7 17 51.88	19.454
β Andromedæ	2.2	1 3 34.426	3.3444	+ 35 2 13.72	19.164
κ Tucanæ	4.9	1 12 2.410	2.0551	— 69 27 37.15	19.170
δ Piscium	5.1	1 12 7.462	+ 3.0897	+ 3 2 5.74	+ 19.033
α Ursæ Minoris (<i>Polaris</i>)	2.2	1 18 31.136	23.3310	+ 88 43 18.40	18.887
θ Ceti	3.6	1 18 31.489	2.9971	— 8 45 4.15	18.667
δ Cassiopeæ	5.9	1 23 2.928	4.3786	+ 69 41 53.28	18.675
κ Octantis S. P.	5.4	1 23 15.630	8.7534	— 94 46 42.32	18.776
η Piscium	3.7	1 25 35.824	+ 3.2026	+ 14 46 42.79	+ 18.663
ν Andromedæ	4.2	1 30 20.525	3.5045	+ 40 51 18.57	18.145
π Piscium	5.5	1 31 16.005	3.1705	+ 11 34 43.37	18.526
α Eridani (<i>Achernar</i>)	0.4	1 33 36.695	2.2323	— 57 47 44.81	18.356
ν Piscium	4.6	1 35 42.411	3.1179	+ 4 55 50.61	18.329
σ Piscium	4.4	1 39 35.095	+ 3.1623	+ 8 36 13.28	+ 18.216
ζ Ceti	3.6	1 46 1.847	2.9618	— 10 52 46.95	17.823
β Arietis	2.8	1 48 33.789	3.3036	+ 20 16 12.10	17.727
δ Cassiopeæ	4.1	1 54 2.842	5.0122	+ 71 53 18.90	17.644
γ Andromedæ	2.2	1 57 8.848	3.6606	+ 41 48 5.41	17.441
α Arietis	2.1	2 0 58.347	+ 3.3711	+ 22 56 31.04	+ 17.172
α Draconis S. P.	3.7	2 1 24.730	1.6238	+ 115 5 54.29	17.299
δ Trianguli	3.1	2 2 59.930	3.5547	+ 34 27 59.85	17.203
ϵ Ceti	4.5	2 7 10.187	+ 3.1741	+ 8 19 49.26	17.029
δ Ursæ Minoris S. P.	4.9	2 9 17.022	— 0.3219	+ 101 56 7.95	16.907
γ Trianguli	4.3	2 10 46.507	+ 3.5511	+ 33 20 17.20	+ 16.844
δ Ceti	5.6	2 11 29.769	2.9894	— 6 55 46.16	16.732
δ Hydri	4.2	2 19 47.615	1.0549	— 69 9 35.95	16.450
ϵ Cassiopeæ	4.6	2 20 0.151	4.8630	+ 66 54 26.20	16.431
ϵ Ceti	4.5	2 22 18.638	+ 3.1838	+ 7 57 59.74	+ 16.294

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0 ^h .0—0 ^h .320, Washington.)						
Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.	
5 Ursæ Minoris . . . S. P.	4.5	2 27 45.799	— 0.1896	+ 103 48 54.15	+ 16.012	
* δ Ceti	4.1	2 33 50.669	+ 3.0728	— 0 8 47.64	15.696	
* μ Hydri	5.3	2 34 0.541	— 1.4339	— 79 35 20.24	15.682	
* θ Persei	4.2	2 36 41.268	+ 4.0700	+ 48 45 45.43	15.456	
γ Ceti	3.6	2 37 36.026	3.1033	+ 2 46 18.56	15.338	
* α Arietis	5.5	2 45 25.160	+ 3.3046	+ 14 37 41.78	+ 15.007	
β Ursæ Minoris . . . S. P.	2.2	2 51 1.826	— 0.2304	+ 105 23 41.95	14.719	
* 47 Cephei (H.) . . .	5.7	2 51 28.829	+ 7.7244	+ 78 58 58.19	14.692	
* ε Arietis	4.6	2 52 55.328	3.4211	+ 20 53 59.93	14.604	
α Ceti	2.6	2 56 31.739	3.1304	+ 3 39 27.85	14.307	
* β Persei (<i>Algol</i>) (<i>var.</i>)	2.3	3 1 0.694	+ 3.8838	+ 40 31 52.32	+ 14.119	
48 Cephei (H.)	5.5	3 6 22.699	7.4089	+ 77 19 45.98	13.727	
ζ Arietis	4.8	3 8 34.714	3.4394	+ 20 38 10.60	13.555	
α Persei	1.9	3 16 28.260	4.2778	+ 49 28 8.33	13.091	
* ρ Octantis S. P.	5.7	3 18 0.874	+ 12.9858	— 95 54 12.91	12.978	
* ι Hydri	5.7	3 18 42.669	— 1.5973	— 77 47 23.42	+ 13.027	
γ ³ Ursæ Minoris . . . S. P.	3.2	3 20 54.411	— 0.1332	+ 107 46 28.54	12.811	
* f Tauri	4.3	3 24 47.965	+ 3.3050	+ 12 33 33.22	12.562	
ε Eridani	3.7	3 27 44.860	2.8237	— 9 49 51.00	12.392	
δ Persei	3.1	3 35 5.651	4.2502	+ 47 26 6.17	11.808	
* γ Camelopardalis (H.).	4.6	3 38 45.121	+ 6.2393	+ 70 59 32.02	+ 11.541	
η Tauri	3.1	3 40 56.710	3.5570	+ 23 45 51.67	11.379	
ζ Persei	3.0	3 47 13.054	+ 3.7603	+ 31 33 22.29	10.948	
ζ Ursæ Minoris . . . S. P.	4.6	3 47 59.941	— 2.2503	+ 101 52 2.77	10.923	
* γ Hydri	3.3	3 48 56.755	— 0.9961	— 74 34 33.24	10.982	
* ε Persei	3.0	3 50 28.291	+ 4.0101	+ 39 41 28.55	+ 10.730	
γ Eridani	3.0	3 52 53.870	2.7986	— 13 49 18.95	10.444	
* A ¹ Tauri	4.6	3 58 11.537	3.5400	+ 21 46 49.63	10.081	
* c Persei	4.3	4 0 40.569	4.3373	+ 47 25 4.75	9.938	
Groombr. 2320 . . . S. P.	5.5	4 6 1.183	0.1400	+ 111 53 59.86	9.498	
* o ¹ Eridani	4.2	4 6 29.751	+ 2.9268	— 7 7 30.00	+ 9.615	
γ Tauri	3.8	4 13 32.009	+ 3.4090	+ 15 21 41.08	8.957	
* η Ursæ Minoris . . . S. P.	5.0	4 20 43.473	— 1.8158	+ 103 59 29.03	8.163	
ε Tauri	3.6	4 22 11.588	+ 3.4975	+ 18 56 8.81	8.256	
η Draconis S. P.	2.0	4 22 30.255	+ 0.8064	+ 118 14 12.33	8.221	
* δ Mensæ	5.6	4 25 25.929	— 4.2223	— 80 28 17.26	+ 8.047	
* m Persei	6.0	4 25 40.548	+ 4.2103	+ 42 49 40.82	8.002	
A Draconis S. P.	5.0	4 28 12.176	— 0.1347	+ 110 59 38.67	7.798	
α Tauri (<i>Aldebaran</i>) .	1.0	4 29 36.514	+ 3.4375	+ 16 17 15.02	7.514	
* τ Tauri	4.5	4 35 38.557	3.5954	+ 22 44 42.48	7.184	
α Camelopardalis . . .	4.4	4 43 6.816	+ 5.9254	+ 66 9 16.65	+ 6.600	
* i Tauri	5.2	4 44 56.345	3.5054	+ 18 39 6.76	6.405	
ι Aurigæ	2.8	4 49 49.815	3.9007	+ 32 59 28.24	6.023	
* ζ Aurigæ	3.9	4 54 47.343	+ 4.1852	+ 40 54 52.07	5.623	
ε Ursæ Minoris . . . S. P.	4.5	4 57 15.610	— 6.3298	+ 97 46 57.87	5.424	
11 Orionis	4.7	4 58 16.979	+ 3.4244	+ 15 15 0.68	+ 5.296	
* β Eridani	2.9	5 2 26.514	2.9485	— 5 13 45.05	4.925	
α Aurigæ (<i>Capella</i>) . .	0.1	5 8 33.790	4.4248	+ 45 53 6.69	4.028	
β Orionis (<i>Rigel</i>) . .	0.3	5 9 15.078	2.8813	— 8 19 45.52	4.398	
* τ Orionis	3.8	5 12 15.907	+ 2.9126	— 6 57 50.43	+ 4.135	

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0^d.0—0^d.320, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		^h ^m ^s	^s	[°] ['] ["]	["]
β Tauri	1.8	5 19 20.296	+ 3.7893	+ 28 30 49.48	+ 3.359
Groombridge 966	6.4	5 25 1.555	8.0011	+ 74 58 9.71	3.068
χ Aurigæ	5.0	5 25 34.178	3.9050	+ 32 6 36.72	3.022
δ Orionis (<i>var.</i>)	2.3	5 26 23.209	3.0634	— 0 22 52.33	2.926
Groombridge 944	6.4	5 26 48.346	18.6553	+ 85 8 22.54	2.907
α Leporis	2.7	5 27 52.718	+ 2.6448	— 17 54 5.62	+ 2.801
ϵ Orionis	1.8	5 30 37.893	3.0423	— 1 16 22.00	2.563
α Columbæ	2.7	5 35 40.012	+ 2.1728	— 34 7 59.66	2.080
ω Draconis S. P.	4.9	5 37 35.802	— 0.3538	+ 111 11 28.70	1.633
κ Orionis	2.3	5 42 32.340	+ 2.8447	— 9 42 33.46	1.530
ν Aurigæ	4.1	5 43 51.920	+ 4.1541	+ 39 6 55.48	+ 1.447
ψ^1 Draconis S. P.	4.8	5 43 53.677	— 1.0790	+ 107 47 50.80	1.681
δ Doradus	4.4	5 44 34.754	+ 0.1048	— 65 46 36.21	1.328
α Orionis (<i>var.</i>)	0.9	5 49 12.985	3.2470	+ 7 23 9.13	0.950
β Aurigæ	2.0	5 51 27.611	4.4017	+ 44 56 6.98	0.737
θ Aurigæ	2.9	5 52 13.256	+ 4.0920	+ 37 12 14.65	+ 0.592
ν Orionis	4.5	6 1 17.544	3.4274	+ 14 46 51.14	— 0.143
22 Camelopardalis (H.)	4.7	6 6 43.203	+ 6.6173	+ 69 21 25.58	0.706
δ Ursæ Minoris S. P.	4.4	6 7 47.641	— 19.4660	+ 93 23 18.24	0.733
η Geminorum	3.5	6 8 14.299	+ 3.6227	+ 22 32 16.75	0.737
μ Geminorum	3.2	6 16 18.374	+ 3.6314	+ 22 34 9.30	— 1.547
ψ^1 Aurigæ	5.1	6 16 25.617	4.6265	+ 49 20 35.10	1.447
α Argûs (<i>Canopus</i>)	0.8	6 21 30.686	1.3305	— 52 38 8.67	1.871
ν Geminorum	4.2	6 22 25.890	+ 3.5630	+ 20 16 51.64	1.982
χ Draconis S. P.	5.3	6 23 2.336	— 1.0796	+ 107 18 54.53	1.637
γ Geminorum	2.0	6 31 21.441	+ 3.4673	+ 16 29 32.91	— 2.783
ϵ Geminorum	3.2	6 37 9.846	3.6933	+ 25 14 21.57	3.251
ψ^3 Aurigæ	5.4	6 38 48.577	4.3290	+ 43 41 9.74	3.232
$\dagger \alpha$ Canis Majoris (<i>Sirius</i>)	1.4	6 40 18.058	2.6436	— 16 33 56.72	4.715
θ Geminorum	3.7	6 45 32.371	3.9605	+ 34 5 35.56	3.990
51 Cephei (H.)	5.3	6 48 45.293	+ 29.8910	+ 87 13 5.07	— 4.325
ζ Mensæ	5.6	6 49 11.560	— 4.9050	— 80 41 49.43	4.190
50 Draconis S. P.	5.6	6 49 55.057	— 1.9083	+ 104 41 45.90	4.408
ϵ Canis Majoris	1.5	6 54 18.189	+ 2.3577	— 28 49 22.57	4.720
ζ Geminorum (<i>var.</i>)	4.0	6 57 35.122	3.5624	+ 20 43 51.21	5.004
δ Canis Majoris	1.9	7 3 55.116	+ 2.4385	— 26 13 8.09	— 5.511
63 Aurigæ	5.2	7 4 5.364	4.1365	+ 39 29 57.63	5.516
25 Camelopardalis	5.3	7 7 54.651	+ 12.9563	+ 82 37 16.44	5.896
γ^2 Volantis (<i>var.</i>)	3.9	7 9 40.588	— 0.4938	— 70 19 13.87	6.004
δ Draconis S. P.	3.1	7 12 31.739	+ 0.0294	+ 112 31 55.06	6.326
δ Geminorum	3.5	7 13 33.220	+ 3.5879	+ 22 11 3.02	— 6.342
τ Draconis S. P.	4.5	7 17 40.021	— 1.1173	+ 106 50 56.14	6.775
Piazzi vii. 67	5.7	7 19 25.989	+ 6.2981	+ 68 41 21.33	6.849
β Canis Minoris	3.1	7 21 11.154	3.2597	+ 8 30 37.08	6.993
α^2 Geminorum (<i>Castor</i>)	1.9	7 27 34.932	3.8384	+ 32 7 45.14	7.555
$\dagger \alpha$ Canis Min. (<i>Procyon</i>)	0.5	7 33 32.622	+ 3.1434	+ 5 30 22.76	— 8.096
λ Ursæ Minoris S. P.	6.5	7 33 35.144	— 65.0520	+ 91 1 59.44	7.972
β Geminorum (<i>Pollux</i>)	1.2	7 38 35.097	+ 3.6791	+ 28 17 28.45	8.419
26 Lyncis	5.8	7 46 42.099	4.3880	+ 47 50 56.00	9.023
ϕ Geminorum	5.0	7 46 45.924	+ 3.6799	+ 27 2 59.79	— 9.039

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1890.0. (January 0 ^d .0—0 ^d .320, Washington.)								
Name of Star.		Magni- tude.	Right Ascension.		Annual Variation.	Declination.		Annual Variation.
			^h	^m ^s	^s	[°]	['] [″]	
* Croombridge 1374 . . .		5.6	7	47	0.996	+ 7.2848	+ 74° 12' 37.77	— 9.061
ε Draconis . . . S. P.		3.9	7	48	32.455	— 0.1795	+ 110 0 43.99	9.173
* ω ¹ Cancri . . .		6.0	7	54	16.550	+ 3.6372	+ 25 41 36.54	9.581
3 Ursæ Majoris (H.) . .		5.5	8	1	51.832	6.0483	+ 68 47 48.57	10.164
15 Argûs (ρ) . . .		3.1	8	2	51.569	2.5545	— 23 59 15.31	10.196
* ζ ¹ Cancri . . .		4.8	8	5	54.198	+ 3.4464	+ 17 58 42.14	— 10.606
* β Cancri . . .		3.8	8	10	32.981	+ 3.2585	+ 9 31 26.07	10.839
* κ Cephei (pr.) . . . S. P.		4.4	8	12	34.958	— 1.9241	+ 102 37 12.41	10.993
* 30 Monocerotis . . .		3.9	8	20	9.822	+ 3.0000	— 3 32 52.72	11.508
* θ Chamæleontis . . .		4.6	8	23	55.619	— 1.7113	— 77 7 45.50	11.760
η Cancri . . .		5.4	8	26	20.894	+ 3.4782	+ 20 48 51.47	— 12.006
Groombr. 3241 . . . S. P.		6.5	8	30	28.661	— 0.2203	+ 107 50 27.66	12.221
* σ Hydræ . . .		4.5	8	33	0.587	+ 3.1458	+ 3 43 37.60	12.436
* γ Cancri . . .		4.9	8	36	55.231	3.4804	+ 21 51 48.69	12.726
ε Hydræ . . .		3.5	8	40	57.069	3.1817	+ 6 49 18.88	13.007
* σ ² Cancri (mean) . . .		5.5	8	47	31.980	+ 3.6734	+ 30 59 43.70	— 13.409
ι Ursæ Majoris . . .		3.3	8	51	40.466	+ 4.1331	+ 48 28 22.75	13.907
12 Year Cat. 1879 . . . S. P.		5.3	8	52	33.651	— 2.5509	+ 99 51 38.16	13.682
σ ² Ursæ Majoris . . .		5.0	9	0	42.512	+ 5.3540	+ 67 34 49.76	14.279
* κ Cancri . . .		5.1	9	1	47.390	3.2558	+ 11 6 37.88	14.293
* θ Hydræ . . .		4.0	9	8	38.509	+ 3.1261	+ 2 46 40.41	— 15.019
* β Argûs . . .		2.0	9	11	59.413	0.6775	— 69 15 50.83	14.806
ι Argûs . . .		2.6	9	14	8.575	1.6011	— 58 48 48.59	14.998
* α Lyncis . . .		3.3	9	14	21.149	3.6690	+ 34 51 25.48	15.028
α Cephei . . . S. P.		2.6	9	15	57.256	1.4365	+ 117 52 49.54	15.173
1 Draconis (H.) . . .		4.5	9	21	21.767	+ 8.9948	+ 81 48 41.93	— 15.457
α Hydræ . . .		2.1	9	22	10.925	2.9491	— 8 10 55.80	15.453
d Ursæ Majoris . . .		4.8	9	24	44.723	5.4000	+ 70 18 47.32	15.564
θ Ursæ Majoris . . .		3.2	9	25	29.797	4.0408	+ 52 10 41.33	16.221
β Cephei (pr.) . . . S. P.		3.4	9	27	14.305	0.7939	+ 109 55 19.92	15.757
* 10 Leonis Minoris . . .		4.7	9	27	29.072	+ 3.6940	+ 36 53 8.02	— 15.785
* ο Leonis . . .		3.8	9	35	16.783	+ 3.2069	+ 10 23 32.60	16.224
* ζ Chamæleontis . . .		5.2	9	37	6.375	— 1.5640	— 80 26 48.98	16.286
ε Leonis . . .		3.2	9	39	36.432	+ 3.4150	+ 24 16 49.30	16.428
11 Cephei . . . S. P.		4.8	9	40	18.633	0.9011	+ 109 11 41.95	16.539
μ Leonis . . .		4.0	9	46	30.440	+ 3.4220	+ 26 31 28.93	— 16.799
* 19 Leonis Minoris . . .		5.2	9	50	56.805	3.6951	+ 41 34 44.86	16.964
79 Draconis . . . S. P.		6.6	9	51	29.637	0.7289	+ 106 49 4.93	17.014
* π Leonis . . .		5.0	9	54	24.029	3.1743	+ 8 34 17.93	17.141
α Leonis (Regulus) . .		1.3	10	2	30.829	3.2005	+ 12 30 16.36	17.476
32 Ursæ Majoris . . .		5.7	10	10	2.446	+ 4.4202	+ 65 39 23.71	— 17.815
* λ Ursæ Majoris . . .		3.6	10	10	27.682	3.6394	+ 43 27 47.16	17.875
γ ¹ Leonis . . .		2.5	10	13	54.470	3.3148	+ 20 23 51.77	18.088
* μ Hydræ . . .		4.1	10	20	46.271	2.9007	— 16 16 30.99	18.312
* β Leonis Minoris . . .		4.3	10	21	31.323	3.4864	+ 37 16 14.39	18.316
* α Antliæ . . .		4.5	10	22	7.078	+ 2.7392	— 30 30 29.81	— 18.219
9 Draconis (H.) . . .		5.0	10	25	44.265	5.2613	+ 76 16 45.11	18.397
ρ Leonis . . .		4.0	10	27	1.184	3.1641	+ 9 52 20.56	18.434
* 226 Cephei (B.) . . . S. P.		5.7	10	30	20.536	1.0773	+ 104 20 25.64	18.529
* β Octantis . . . S. P.		4.4	10	31	46.485	+ 6.4810	— 98 2 32.67	— 18.684

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0^d.0—0^d.320, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s		°	'	"	
* 41 Leonis Minoris . . .	5.1	10	37	26.084	+ 3.2707	+ 23	45	50.70	— 18.740
η Argûs (<i>var.</i>) . . .	1-6	10	40	47.590	2.3136	— 59	6	22.70	18.871
l Leonis . . .	5.3	10	43	28.545	3.1585	+ 11	7	37.42	18.974
* δ ² Chamæleontis . . .	4.7	10	44	44.889	0.6372	— 79	57	37.02	18.982
ε Cephei . . . S. P.	3.6	10	45	45.801	2.1220	+ 114	22	41.35	18.878
* 46 Leonis Minoris . . .	3.9	10	47	9.560	+ 3.3694	+ 34	48	28.49	— 19.297
* Groombridge 1706 . . .	6.3	10	51	8.344	4.9680	+ 78	21	33.47	19.183
α Ursæ Majoris . . .	2.0	10	56	56.140	+ 3.7470	+ 62	20	40.99	19.365
* η Octantis . . .	6.1	11	0	4.934	— 0.2159	— 84	0	7.74	19.372
* p ³ Leonis . . .	6.2	11	1	17.569	+ 3.0620	+ 2	33	8.46	19.488
ψ Ursæ Majoris . . .	3.2	11	3	28.672	+ 3.3931	+ 45	5	41.61	— 19.505
δ Leonis . . .	2.7	11	8	15.501	3.1992	+ 21	7	34.41	19.687
ν Ursæ Majoris . . .	3.7	11	12	32.354	3.2575	+ 33	41	40.08	19.574
δ Crateris . . .	3.9	11	13	50.494	2.9964	— 14	11	0.60	19.465
υ Cephei . . . S. P.	5.1	11	14	6.666	2.4442	+ 112	29	24.77	19.670
τ Leonis . . .	5.1	11	22	16.814	+ 3.0861	+ 3	27	42.97	— 19.803
λ Draconis . . .	4.0	11	24	51.998	3.6208	+ 69	56	17.14	19.839
* ξ Hydræ . . .	3.8	11	27	35.482	2.9430	— 31	14	56.95	19.886
υ Leonis . . .	4.4	11	31	19.002	3.0713	— 0	12	59.59	19.861
γ Cephei . . . S. P.	3.5	11	34	49.965	2.4158	+ 102	58	54.03	20.076
* χ Ursæ Majoris . . .	3.9	11	40	14.477	+ 3.1902	+ 48	23	21.26	— 19.962
β Leonis . . .	2.2	11	43	26.931	3.0640	+ 15	11	12.85	20.120
γ Ursæ Majoris . . .	2.4	11	48	2.664	3.1816	+ 54	18	22.46	20.027
Groombr. 4163 . . . S. P.	7.0	11	49	29.210	2.8656	+ 106	12	6.63	20.023
* π Virginis . . .	4.6	11	55	14.152	3.0751	+ 7	13	39.62	20.088
ο Virginis . . .	4.3	11	59	36.340	+ 3.0576	+ 9	20	38.13	— 20.015
* ε Corvi . . .	3.2	12	4	28.033	3.0830	— 22	0	28.56	20.049
4 Draconis (H.) . . .	5.1	12	7	2.791	2.8853	+ 78	13	38.98	20.022
γ Corvi . . .	2.7	12	10	8.967	3.0796	— 16	55	52.20	20.017
* 2 Canum Venaticorum	6.0	12	10	36.826	3.0220	+ 41	16	21.45	20.065
β Chamæleontis . . .	4.5	12	11	54.277	+ 3.4012	— 78	42	4.37	— 20.003
η Virginis . . .	4.0	12	14	16.700	3.0686	— 0	3	19.91	20.042
* 6 Ursæ Minoris . . .	6.2	12	14	20.390	0.1610	+ 88	18	35.43	19.940
α ¹ Crucis . . .	0.9	12	20	29.022	3.2956	— 62	29	21.69	20.014
* δ ² Corvi . . .	3.1	12	24	10.490	3.1026	— 15	54	10.01	20.084
* β Canum Venaticorum	4.4	12	28	31.116	+ 2.8594	+ 41	57	18.69	— 19.615
β Corvi . . .	2.8	12	28	36.548	3.1417	— 22	47	18.26	19.963
κ Draconis . . .	3.8	12	28	47.225	2.5916	+ 70	23	40.44	19.889
* γ Virginis (<i>mean</i>) . . .	2.9	12	36	5.211	3.0383	— 0	50	46.39	19.815
21 Cassiopeæ . . . S. P.	5.7	12	38	23.220	3.8585	+ 105	36	47.93	19.752
* 31 Comæ Berenices . . .	5.1	12	46	20.525	+ 2.9301	+ 28	8	21.28	— 19.661
32 ³ Camelopardalis (H.) . . .	5.2	12	48	19.458	0.3939	+ 84	0	38.76	19.596
* γ Cassiopeæ . . . S. P.	2.3	12	50	4.280	3.5794	+ 119	52	45.04	19.563
α Canum Venaticorum	3.2	12	50	52.960	2.8154	+ 38	54	44.92	19.512
* 43 Cephei (H.) . . . S. P.	4.6	12	53	48.198	7.2427	+ 94	20	0.00	19.502
* δ Muscæ . . .	3.8	12	54	43.120	+ 4.1350	— 70	57	18.12	— 19.475
* ε Virginis . . .	3.1	12	56	42.103	2.9890	+ 11	33	1.62	19.417
θ Virginis . . .	4.6	13	4	15.250	3.1012	— 4	57	5.91	19.312
* 20 Canum Venaticorum	4.7	13	12	36.599	2.6967	+ 41	9	6.49	19.035
α Urs. Min. (<i>Polaris</i>) S. P.	2.2	13	18	31.136	+ 23.3310	+ 91	16	41.60	— 18.387

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0 ^d .0—0 ^d .320, Washington.)						
Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.	
<i>α</i> Virginis (<i>Spica</i>) . . .	1.1	^h 13 ^m 19 ^s 23.866	+ 3.1538	— 10° 35' 13.36	— 18.900	
38 Cassiopeæ . . . S. P.	5.9	13 23 2.928	4.3786	+ 110 18 6.72	18.675	
* <i>κ</i> Octantis . . .	5.4	13 23 15.630	8.7534	— 85 13 17.68	18.776	
<i>ζ</i> Virginis . . .	3.6	13 29 5.275	3.0532	— 0 1 59.91	18.517	
* B. A. C. 4536 . . .	5.0	13 29 53.069	2.6823	+ 37 44 45.81	18.538	
* <i>m</i> Virginis . . .	5.4	13 35 50.317	+ 3.1433	— 8 8 51.71	— 18.289	
<i>η</i> Ursæ Majoris . . .	1.9	13 43 12.411	2.3712	+ 49 51 44.45	18.078	
<i>η</i> Bootis . . .	2.8	13 49 26.838	2.8568	+ 18 56 57.64	18.170	
50 Cassiopeæ . . . S. P.	4.1	13 54 2.842	5.0122	+ 108 6 41.10	17.644	
* <i>θ</i> Apodis . . .	Var.	13 54 37.836	5.6763	— 76 15 53.50	17.590	
<i>β</i> Centauri . . .	0.7	13 56 3.652	+ 4.1782	— 59 50 31.31	— 17.589	
* <i>π</i> Hydræ . . .	3.6	14 0 6.408	3.4010	— 26 9 5.39	17.383	
<i>α</i> Draconis . . .	3.7	14 1 24.730	1.6238	+ 64 54 5.71	17.299	
* <i>d</i> Bootis . . .	4.8	14 5 22.973	2.7387	+ 25 36 46.50	17.200	
* <i>κ</i> Virginis . . .	4.2	14 7 1.687	+ 3.1939	— 9 45 41.44	16.928	
* <i>4</i> Ursæ Minoris . . .	4.9	14 9 17.022	— 0.3219	+ 78 3 52.05	— 16.907	
* <i>δ</i> Octantis . . .	5.0	14 9 21.345	+ 8.9830	— 83 9 46.05	16.951	
<i>α</i> Bootis (<i>Arcturus</i>) . . .	0.2	14 10 38.654	2.7350	+ 19 45 19.10	18.883	
* <i>λ</i> Bootis . . .	4.3	14 12 12.109	2.2827	+ 46 35 36.82	16.659	
* <i>λ</i> Virginis . . .	4.7	14 13 9.467	3.2380	— 12 51 52.13	16.728	
<i>ι</i> Cassiopeæ . . . S. P.	4.6	14 20 0.151	+ 4.8630	+ 113 5 33.80	— 16.431	
<i>θ</i> Bootis . . .	4.1	14 21 27.184	2.0442	+ 52 21 33.50	16.761	
<i>ρ</i> Bootis . . .	3.6	14 27 5.424	+ 2.5877	+ 30 51 15.98	15.960	
5 Ursæ Minoris . . .	4.5	14 27 45.799	— 0.1896	+ 76 11 5.85	16.012	
<i>α</i> ² Centauri . . .	0.1	14 32 9.045	+ 4.0464	— 60 23 2.62	15.375	
* <i>μ</i> Hydri . . . S. P.	5.3	14 34 0.511	— 1.4339	— 100 24 39.76	— 15.682	
* <i>α</i> Apodis . . .	4.1	14 34 13.678	+ 7.1963	— 78 34 37.28	15.714	
* 33 Bootis . . .	5.3	14 34 44.608	2.2343	+ 44 52 45.42	15.710	
<i>ε</i> Bootis . . .	2.6	14 40 11.043	2.6213	+ 27 32 17.44	15.341	
<i>α</i> ³ Libræ . . .	2.9	14 44 47.562	+ 3.3096	— 15 35 3.54	15.168	
<i>β</i> Ursæ Minoris . . .	2.2	14 51 1.826	— 0.2304	+ 74 36 18.05	— 14.719	
* 47 Cephei (H.) . . . S. P.	5.7	14 51 28.829	+ 7.7344	+ 101 1 1.81	14.692	
* <i>γ</i> Scorpii . . .	3.4	14 57 37.991	3.5022	— 24 50 56.69	14.355	
<i>β</i> Bootis . . .	3.7	14 57 48.177	2.2601	+ 40 49 28.60	14.361	
48 Cephei (H.) . . . S. P.	5.5	15 6 22.699	7.4089	+ 102 40 14.02	13.727	
* <i>δ</i> Bootis . . .	3.5	15 11 4.126	+ 2.4209	+ 33 43 32.21	— 13.583	
<i>β</i> Libræ . . .	2.9	15 11 5.254	3.2218	— 8 58 36.01	13.508	
* <i>ρ</i> Octantis . . .	5.7	15 18 0.874	12.9859	— 84 5 47.09	12.978	
<i>μ</i> ¹ Bootis . . .	4.5	15 20 20.118	+ 2.2662	+ 37 45 47.75	12.779	
<i>γ</i> ³ Ursæ Minoris . . .	3.2	15 20 54.411	— 0.1332	+ 72 13 31.46	12.811	
* <i>β</i> Coronæ Borealis . . .	3.9	15 23 17.657	+ 2.4751	+ 29 29 6.12	— 12.594	
<i>α</i> Coronæ Borealis . . .	2.3	15 30 1.855	2.5393	+ 27 5 6.64	12.305	
* <i>γ</i> Camelop. (H.) . . . S. P.	4.6	15 38 45.121	6.2393	+ 109 0 27.98	11.541	
<i>α</i> Serpentis . . .	2.7	15 38 50.987	2.9516	+ 6 46 19.22	11.550	
<i>ε</i> Serpentis . . .	3.7	15 45 19.969	+ 2.9872	+ 4 48 33.49	11.048	
<i>ζ</i> Ursæ Minoris . . .	4.6	15 47 59.941	— 2.2503	+ 78 7 57.23	— 10.923	
<i>ε</i> Coronæ Borealis . . .	4.1	15 53 2.075	+ 2.4832	+ 27 11 48.23	10.611	
<i>δ</i> Scorpii . . .	2.6	15 53 49.763	3.5388	— 22 18 29.04	10.527	
<i>β</i> ¹ Scorpii . . .	2.9	15 59 2.472	3.4809	— 19 30 13.92	10.138	
* <i>δ</i> ¹ Apodis . . .	4.9	16 3 55.733	+ 8.7763	— 78 25 0.64	— 9.729	

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0^h.0—0^h.320, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
* φ Herculis . . .	4.2	^h 16 ^m 5 ^s 18.033	+ 1.8813	+ 45° 13' 24".75	— 9.581
Groombridge 2320 . . .	5.5	16 6 1.183	0.1400	+ 68 6 0.14	9.498
δ Ophiuchi . . .	2.8	16 8 34.863	3.1397	— 3 24 38.13	9.513
* σ Coronæ Borealis (<i>mean</i>) . . .	5.3	16 10 33.493	2.2447	+ 34 8 16.15	9.256
τ Herculis . . .	3.9	16 16 26.088	1.8011	+ 46 34 31.51	8.734
* γ Apodis . . .	4.0	16 16 36.215	+ 9.0657	— 78 38 55.17	— 8.744
* η Ursæ Minoris . . .	5.0	16 20 43.473	— 1.8158	+ 76 0 30.97	8.163
η Draconis . . .	2.0	16 22 30.255	+ 0.8064	+ 61 45 47.67	8.221
α Scorpii (<i>Antares</i>) . . .	1.2	16 22 39.767	3.6703	— 26 11 14.22	8.300
β Herculis . . .	2.8	16 25 29.476	+ 2.5775	+ 21 43 46.99	8.056
A Draconis . . .	5.0	16 28 12.176	— 0.1347	+ 69 0 21.33	— 7.798
ζ Ophiuchi . . .	2.8	16 31 6.103	+ 3.2991	— 10 20 37.51	7.563
α Trianguli Australis . . .	2.2	16 37 1.376	6.3042	— 68 49 27.66	7.153
γ Herculis . . .	3.7	16 39 7.464	2.0538	+ 39 7 54.27	7.021
α Camelopardalis S. P. . .	4.4	16 43 6.816	5.9254	+ 113 50 43.35	6.600
κ Ophiuchi . . .	3.4	16 52 27.705	+ 2.8375	+ 9 32 47.55	— 5.830
ϵ Ursæ Minoris . . .	4.5	16 57 15.610	— 6.3208	+ 82 13 2.13	5.424
d Herculis . . .	5.3	16 57 32.684	+ 2.2113	+ 33 43 40.47	5.395
* η Ophiuchi . . .	2.5	17 4 4.146	3.4370	— 15 35 17.14	4.736
α^1 Herculis (<i>var.</i>) . . .	3.1	17 9 37.905	2.7335	+ 14 30 58.15	4.344
* π Herculis . . .	3.4	17 11 12.973	+ 2.0891	+ 36 56 0.28	— 4.228
* θ Ophiuchi . . .	3.3	17 15 15.220	3.6792	— 24 53 20.91	3.941
b Ophiuchi (<i>var.</i>) . . .	4.4	17 19 39.141	3.6591	— 24 4 24.29	3.643
* δ Aræ . . .	3.8	17 21 10.294	5.4017	— 60 35 28.40	3.522
Groombr. 966 S. P. . .	6.4	17 25 1.555	8.0011	+ 105 1 50.29	3.068
* Groombr. 944 S. P. . .	6.4	17 26 48.346	+ 18.6553	+ 94 51 37.46	— 2.907
β Draconis . . .	3.0	17 27 56.871	1.3534	+ 52 22 58.41	2.796
α Ophiuchi . . .	2.2	17 29 49.699	2.7829	+ 12 38 25.94	2.869
* ϵ Herculis . . .	4.0	17 36 21.700	+ 1.6966	+ 46 3 54.18	2.066
ω Draconis . . .	4.9	17 37 35.802	— 0.3538	+ 68 48 31.30	1.633
μ Herculis . . .	3.5	17 42 9.239	+ 2.3464	+ 27 47 6.98	— 2.320
ψ^1 Draconis . . .	4.8	17 43 53.677	— 1.0790	+ 72 12 9.20	1.681
* θ Herculis . . .	3.9	17 52 28.809	+ 2.0551	+ 37 15 55.45	0.639
γ Draconis . . .	2.5	17 54 3.114	1.3915	+ 51 30 6.96	0.550
γ^3 Sagittarii . . .	2.9	17 58 44.487	3.8515	— 30 25 29.09	— 0.329
* ν Herculis . . .	3.9	18 3 15.106	+ 2.3394	+ 28 44 51.58	+ 0.287
22 Camelop. (H.) S. P. . .	4.7	18 6 43.203	6.6173	+ 110 38 34.42	0.706
μ^1 Sagittarii . . .	4.1	18 7 11.098	+ 3.5866	— 21 5 12.94	0.616
δ Ursæ Minoris . . .	4.4	18 7 47.641	— 19.4660	+ 86 36 41.76	0.733
η Serpentis . . .	3.5	18 15 37.076	+ 3.1023	— 2 55 35.65	0.691
* λ Sagittarii . . .	2.9	18 21 10.919	+ 3.7027	— 25 28 54.78	+ 1.641
* χ Draconis . . .	5.3	18 23 2.336	— 1.0796	+ 72 41 5.47	1.637
1 Aquilæ . . .	4.0	18 29 13.272	+ 3.2645	— 8 19 13.84	2.220
* ζ Pavonis . . .	4.2	18 30 10.680	7.0290	— 71 31 13.40	2.502
α Lyræ (<i>Vega</i>) . . .	0.2	18 33 12.865	2.0313	+ 38 40 53.36	3.169
σ Octantis . . .	5.6	18 42 23.102	+ 105.9460	— 89 16 1.15	+ 3.668
β Lyræ (<i>var.</i>) . . .	3.6	18 46 1.137	2.2142	+ 33 14 6.59	3.962
σ Sagittarii . . .	2.3	18 48 26.669	3.7216	— 26 25 57.67	4.130
51 Cephei (H.) S. P. . .	5.3	18 48 45.293	+ 29.8910	+ 92 46 54.93	4.325
50 Draconis . . .	5.6	18 49 55.057	— 1.9083	+ 75 18 14.10	+ 4.408

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0 ^d .0—0 ^d .320, Washington.)						
Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.
		^h	^m	^s	^s	^o ['] ["]
* γ Lyrae	3.3	18	54	49.746	+ 2.2443	+ 32 32 20.46
ζ Aquilæ	3.1	19	0	21.265	2.7569	+ 13 42 1.33
* ε Lyrae	5.2	19	3	22.625	2.1411	+ 35 55 40.96
* 25 Camelopardalis S. P.	5.3	19	7	54.651	12.9563	+ 97 22 43.56
δ Sagittarii	5.0	19	11	11.926	3.5122	— 19 8 52.96
δ Draconis	3.1	19	12	31.739	+ 0.0294	+ 67 28 4.94
* θ Lyrae	4.4	19	12	32.949	+ 2.0789	+ 37 56 16.72
τ Draconis	4.5	19	17	40.021	— 1.1173	+ 73 9 3.86
Piazzi vii. 67	5.7	19	19	25.989	+ 6.2961	+ 111 18 38.67
δ Aquilæ	3.5	19	19	57.128	3.0252	+ 2 53 45.30
* β Cygni	3.1	19	26	17.123	+ 2.4193	+ 27 43 44.18
κ Aquilæ	5.0	19	30	58.404	+ 3.2269	— 7 16 17.26
λ Ursæ Minoris	6.5	19	33	35.144	— 65.0520	+ 88 58 0.56
* β Sagittæ	4.5	19	36	6.516	+ 2.6955	+ 17 13 17.10
γ Aquilæ	2.8	19	41	1.810	2.8522	+ 10 20 44.10
* δ Cygni	2.9	19	41	32.249	+ 1.8761	+ 44 51 44.72
α Aquilæ (<i>Altair</i>)	0.9	19	45	24.987	2.9276	+ 8 34 41.41
* Groombr. 1374	5.6	19	47	0.996	7.2848	+ 105 47 22.23
* ε Pavonis	4.1	19	47	51.280	+ 7.0187	— 73 11 56.19
ε Draconis	3.9	19	48	32.455	— 0.1795	+ 69 59 16.01
β Aquilæ	3.9	19	49	54.602	+ 2.9471	+ 6 7 56.46
* γ Sagittæ	3.6	19	53	51.923	2.6678	+ 19 11 37.69
* c Sagittarii	4.5	19	55	53.564	3.6948	— 28 0 54.21
τ Aquilæ	5.7	19	58	46.030	2.9330	+ 6 58 4.27
3 Ursæ Majoris (H.) S. P.	5.5	20	1	51.832	6.0483	+ 111 12 11.43
* θ Aquilæ	3.3	20	5	37.721	+ 3.0974	— 1 8 50.68
* 31 Cygni	3.9	20	10	10.085	1.8893	+ 46 24 28.33
α ² Capricorni	3.7	20	11	57.082	+ 3.3321	— 12 53 7.11
κ Cephei (<i>pr.</i>)	4.4	20	12	34.958	— 1.9241	+ 77 22 47.59
α Pavonis	2.0	20	16	56.980	+ 4.7837	— 57 5 11.90
γ Cygni	2.3	20	18	16.937	+ 2.1537	+ 39 54 17.10
π Capricorni	5.1	20	21	1.512	3.4396	— 18 34 18.74
ε Delphini	4.0	20	27	57.491	+ 2.8672	+ 10 55 47.44
Groombridge 3241	6.5	20	30	28.661	— 0.2203	+ 72 9 32.34
* α Delphini	3.9	20	34	31.726	+ 2.7878	+ 15 31 27.35
* β Pavonis	3.4	20	35	2.452	+ 5.4734	— 66 35 50.70
α Cygni	1.4	20	37	40.939	2.0444	+ 44 53 14.59
* ψ Capricorni	4.3	20	39	34.838	3.5584	— 25 39 56.74
* ε Cygni	2.6	20	41	45.638	2.4277	+ 33 33 30.05
μ Aquarii	4.8	20	46	43.255	+ 3.2397	— 9 23 44.66
12 Year Catalogue, 1879.	5.3	20	52	33.651	— 2.5509	+ 80 8 21.84
ν Cygni	4.1	20	53	4.334	+ 2.2342	+ 40 44 37.83
σ ² Ursæ Majoris	5.0	21	0	42.512	5.3540	+ 112 25 10.24
61 ¹ Cygni	5.4	21	1	57.963	2.6832	+ 38 12 31.13
ζ Cygni	3.3	21	8	15.245	2.5497	+ 29 46 33.15
* τ Cygni	3.8	21	10	24.029	+ 2.3935	+ 37 34 33.75
α Cephei	2.6	21	15	57.256	1.4365	+ 62 7 10.46
1 Pegasi	4.3	21	16	59.932	2.7722	+ 19 20 2.70
* ζ Capricorni	3.8	21	20	23.135	3.4325	— 22 53 14.58
1 Draconis (H.)	4.5	21	21	21.767	+ 8.9948	+ 98 11 18.07

Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1890.0. (January 0^d.0—0^d.320, Washington.)

Name of Star.		Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
<i>d</i> Ursæ Majoris	S. P.	4.8	^h 21 ^m 24 ^s 44.723	+ 5.4006	+ 109° 41' 12.68	+ 15.564
<i>β</i> Aquarii		2.9	21 25 46.100	3.1617	— 6 3 17.43	15.664
<i>β</i> Cephei (<i>pr.</i>)		3.4	21 27 14.305	0.7939	+ 70 4 40.08	15.757
<i>ε</i> Aquarii		4.8	21 31 53.792	3.1979	— 8 20 50.08	15.974
* 74 Cygni		5.0	21 32 32.411	2.4015	+ 39 55 9.64	16.053
* <i>λ</i> ¹ Octantis		5.4	21 33 58.269	+ 9.7817	— 83 13 26.14	+ 16.039
* <i>ζ</i> Chamæleontis	S. P.	5.2	21 37 6.375	— 1.5640	— 99 33 11.02	16.286
<i>ε</i> Pegasi		2.4	21 38 47.025	+ 2.9467	+ 9 22 15.27	16.359
11 Cephei		4.8	21 40 18.633	0.9011	+ 70 48 18.05	16.539
* <i>π</i> ³ Cygni		4.5	21 42 43.780	2.2133	+ 48 48 2.75	16.545
<i>μ</i> Capricorni		5.2	21 47 17.928	+ 3.2760	— 14 4 9.58	+ 16.782
* 16 Pegasi		5.3	21 48 3.421	2.7378	+ 25 24 27.92	16.821
79 Draconis		6.6	21 51 29.637	0.7289	+ 73 10 55.07	17.014
<i>α</i> Aquarii		3.0	22 0 8.048	3.0827	— 0 51 14.55	17.358
<i>α</i> Gruis		1.9	22 1 17.891	3.8058	— 47 29 35.71	17.250
* <i>π</i> Pegasi		4.3	22 5 6.135	+ 2.6601	+ 32 38 19.35	+ 17.582
32 Ursæ Majoris	S. P.	5.7	22 10 2.446	4.4202	+ 114 20 36.29	17.815
* <i>ν</i> Octantis		6.2	22 10 24.934	13.1584	— 86 31 32.15	17.891
<i>θ</i> Aquarii		4.4	22 11 1.751	3.1691	— 8 19 50.97	17.904
* <i>γ</i> Aquarii		4.0	22 15 58.461	3.1008	— 1 56 29.34	18.041
<i>π</i> Aquarii		4.6	22 19 39.578	+ 3.0647	+ 0 49 9.78	+ 18.157
* <i>σ</i> Aquarii		4.9	22 24 49.453	3.1757	— 11 14 26.30	18.320
9 Draconis	S. P.	5.0	22 25 44.265	5.2613	+ 103 43 14.89	18.397
* <i>α</i> Lacertæ		3.9	22 26 45.573	2.4623	+ 49 43 1.19	18.417
<i>η</i> Aquarii		4.2	22 29 42.232	3.0836	— 0 41 3.50	18.459
226 Cephei (B.)		5.7	22 30 20.536	+ 1.0773	+ 75 39 34.36	+ 18.529
* 10 Lacertæ		5.0	22 34 19.535	2.6866	+ 38 28 40.25	18.671
* <i>β</i> Octantis		4.4	22 34 46.485	6.4810	— 81 57 27.33	18.684
* <i>ζ</i> Pegasi		3.5	22 35 58.567	2.9909	+ 10 15 26.22	18.707
* <i>λ</i> Pegasi		4.1	22 41 13.958	2.8852	+ 22 59 12.82	18.869
<i>ε</i> Cephei		3.6	22 45 45.801	+ 2.1220	+ 65 37 18.65	+ 18.878
<i>λ</i> Aquarii		3.8	22 46 52.571	3.1328	— 8 9 53.10	19.076
* Groombr. 1706	S. P.	6.3	22 51 8.344	4.9680	+ 101 38 26.53	19.183
<i>α</i> Pis. Aus. (<i>Fomalhaut</i>)		1.3	22 51 34.282	3.3247	— 30 12 18.32	18.995
* <i>α</i> Andromedæ		3.8	22 56 51.596	2.7500	+ 41 44 5.00	19.288
<i>α</i> Ursæ Majoris	S. P.	2.0	22 56 56.140	+ 3.7470	+ 117 39 19.01	+ 19.364
<i>α</i> Pegasi (<i>Markab</i>)		2.5	22 59 16.895	2.9850	+ 14 36 48.43	19.303
* <i>φ</i> Aquarii		4.3	23 8 37.559	3.1088	— 6 38 30.64	19.359
* <i>α</i> Cephei		5.1	23 14 6.666	2.4442	+ 67 30 35.23	19.670
* <i>τ</i> Pegasi		4.6	23 15 11.544	2.9636	+ 23 8 17.37	19.657
<i>θ</i> Piscium		4.3	23 22 23.282	+ 3.0411	+ 5 46 28.86	+ 19.728
<i>λ</i> Draconis	S. P.	4.0	23 24 51.998	3.6208	+ 110 3 42.86	19.839
* <i>λ</i> Andromedæ		3.8	23 32 10.866	2.9223	+ 45 51 42.99	19.472
<i>ε</i> Piscium		4.3	23 34 17.555	3.0841	+ 5 1 48.39	19.484
<i>γ</i> Cephei		3.5	23 34 49.965	2.4158	+ 77 1 5.97	20.076
* <i>i</i> ¹ Aquarii		5.0	23 38 29.800	+ 3.1169	— 18 53 14.45	+ 19.960
* <i>δ</i> Sculptoris		4.3	23 43 11.778	3.1324	— 28 44 17.92	19.857
* <i>γ</i> ¹ Octantis		5.3	23 45 37.365	3.6880	— 82 37 48.59	19.993
Groombridge 4163		7.0	23 49 29.210	2.8656	+ 73 47 53.37	20.023
<i>ω</i> Piscium		4.0	23 53 39.771	3.0784	+ 6 15 15.43	19.931
* 33 Piscium		4.7	23 59 42.312	+ 3.0709	— 6 19 22.33	+ 20.143

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Ursæ Minoris. (<i>Polaris</i> .)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	<i>δ</i> Ursæ Minoris.		Mean Solar Date.	<i>λ</i> Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Jan.	^h 1 ^m 18	+88° 43'	Jan.	^h 6 ^m 49	+87° 13'	Jan.	^h 18 ^m 7	+86° 36'	Jan.	^h 19 ^m 32	+88° 57'
0.3	^s 36.18	31.9	0.5	^s 3.04	4.8	1.0	^s 31.41	39.3	1.0	^s 44.46	63.2
1.3	35.32	32.0	1.5	3.14	5.1	2.0	31.41	39.0	2.0	43.99	62.9
2.3	34.48	32.1	2.5	3.25	5.4	3.0	31.40	38.7	3.0	43.50	62.7
3.3	33.60	32.2	3.5	3.38	5.7	4.0	31.38	38.3	4.0	43.00	62.4
4.3	32.70	32.3	4.5	3.52	6.0	5.0	31.38	38.0	5.0	42.50	62.1
5.3	31.75	32.4	5.5	3.64	6.3	6.0	31.39	37.6	6.0	42.00	61.7
6.3	30.73	32.5	6.5	3.74	6.7	7.0	31.41	37.2	7.0	41.55	61.4
7.3	29.67	32.6	7.5	3.82	7.0	8.0	31.45	36.8	8.0	41.17	61.0
8.2	28.57	32.7	8.5	3.86	7.4	9.0	31.52	36.5	9.0	40.87	60.6
9.2	27.47	32.8	9.5	3.88	7.8	9.9	31.61	36.1	10.0	40.63	60.3
10.2	26.37	32.8	10.5	3.86	8.1	10.9	31.72	35.7	11.0	40.47	59.9
11.2	25.32	32.8	11.5	3.83	8.5	11.9	31.83	35.4	12.0	40.36	59.6
12.2	24.33	32.8	12.5	3.78	8.8	12.9	31.94	35.1	13.0	40.27	59.2
13.2	23.39	32.8	13.5	3.73	9.1	13.9	32.05	34.8	14.0	40.20	58.9
14.2	22.49	32.8	14.5	3.70	9.4	14.9	32.14	34.5	15.0	40.09	58.6
15.2	21.62	32.9	15.5	3.69	9.7	15.9	32.22	34.2	16.0	39.93	58.3
16.2	20.75	32.9	16.5	3.69	10.0	16.9	32.30	33.9	17.0	39.72	58.0
17.2	19.87	32.9	17.5	3.71	10.3	17.9	32.38	33.6	18.0	39.51	57.7
18.2	18.94	33.0	18.5	3.73	10.6	18.9	32.46	33.2	19.0	39.38	57.4
19.2	17.94	33.0	19.5	3.74	10.9	19.9	32.55	32.9	20.0	39.08	57.1
20.2	16.91	33.0	20.4	3.73	11.3	20.9	32.67	32.5	21.0	38.94	56.7
21.2	15.83	33.0	21.4	3.69	11.6	21.9	32.81	32.2	22.0	38.88	56.3
22.2	14.73	33.0	22.4	3.62	12.0	22.9	32.98	31.8	23.0	38.90	55.9
23.2	13.62	33.0	23.4	3.51	12.3	23.9	33.15	31.5	24.0	39.00	55.6
24.2	12.55	32.9	24.4	3.38	12.7	24.9	33.35	31.2	25.0	39.17	55.2
25.2	11.52	32.9	25.4	3.21	13.0	25.9	33.55	30.9	26.0	39.40	54.9
26.2	10.55	32.8	26.4	3.04	13.3	26.9	33.75	30.6	27.0	39.66	54.6
27.2	9.63	32.7	27.4	2.89	13.6	27.9	33.95	30.3	28.0	39.90	54.3
28.2	8.76	32.6	28.4	2.73	13.9	28.9	34.14	30.1	29.0	40.12	54.0
29.2	7.91	32.5	29.4	2.59	14.1	29.9	34.32	29.8	30.0	40.31	53.7
30.2	7.06	32.5	30.4	2.47	14.4	30.9	34.51	29.5	31.0	40.47	53.4
31.2	6.19	32.4	31.4	2.35	14.7	31.9	34.68	29.3	32.0	40.61	53.1
32.2	5.27	32.3	32.4	2.23	15.0	32.9	34.87	29.0			

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Feb.	^h 1 ^m 17	+88° 43'	Feb.	^h 6 ^m 48	+87° 13'	Feb.	^h 18 ^m 7	+86° 36'	Feb.	^h 19 ^m 32	+86° 57'
	^s	"		^s	"		^s	"		^s	"
1.2	65.27	32.3	1.4	62.23	15.0	1.9	34.87	29.0	1.0	40.61	53.1
2.2	64.32	32.3	2.4	62.12	15.3	2.9	35.06	28.7	2.0	40.77	52.8
3.2	63.32	32.2	3.4	61.96	15.6	3.9	35.28	28.4	2.9	40.94	52.4
4.2	62.28	32.1	4.4	61.77	15.9	4.9	35.53	28.1	3.9	41.20	52.1
5.2	61.23	32.0	5.4	61.55	16.3	5.9	35.79	27.8	4.9	41.53	51.7
6.2	60.21	31.9	6.4	61.31	16.6	6.9	36.07	27.5	5.9	41.93	51.3
7.2	59.22	31.7	7.4	61.05	16.9	7.9	36.35	27.2	6.9	42.40	51.0
8.2	58.29	31.5	8.4	60.76	17.2	8.9	36.65	27.0	7.9	42.93	50.7
9.2	57.45	31.4	9.4	60.49	17.4	9.9	36.93	26.8	8.9	43.48	50.4
10.2	56.63	31.2	10.4	60.22	17.7	10.9	37.20	26.6	9.9	44.05	50.1
11.2	55.87	31.0	11.4	59.96	17.9	11.9	37.46	26.4	10.9	44.60	49.8
12.2	55.13	30.9	12.4	59.72	18.1	12.9	37.70	26.2	11.9	45.10	49.5
13.1	54.40	30.7	13.4	59.50	18.3	13.9	37.94	26.0	12.9	45.57	49.3
14.1	53.66	30.6	14.4	59.29	18.6	14.9	38.19	25.8	13.9	46.01	49.0
15.1	52.85	30.5	15.4	59.08	18.8	15.9	38.42	25.5	14.9	46.41	48.7
16.1	52.02	30.3	16.4	58.87	19.1	16.8	38.68	25.3	15.9	46.82	48.4
17.1	51.13	30.2	17.4	58.63	19.4	17.8	38.97	25.0	16.9	47.27	48.1
18.1	50.23	30.0	18.4	58.35	19.7	18.8	39.27	24.8	17.9	47.80	47.8
19.1	49.32	29.9	19.4	58.04	19.9	19.8	39.60	24.6	18.9	48.40	47.5
20.1	48.44	29.7	20.4	57.71	20.2	20.8	39.93	24.4	19.9	49.09	47.2
21.1	47.61	29.4	21.4	57.34	20.4	21.8	40.27	24.2	20.9	49.84	46.9
22.1	46.85	29.2	22.4	56.98	20.6	22.8	40.61	24.0	21.9	50.66	46.6
23.1	46.15	28.9	23.4	56.60	20.8	23.8	40.94	23.9	22.9	51.50	46.4
24.1	45.51	28.7	24.4	56.24	21.0	24.8	41.27	23.8	23.9	52.33	46.1
25.1	44.91	28.5	25.3	55.91	21.2	25.8	41.58	23.6	24.9	53.15	45.9
26.1	44.33	28.2	26.3	55.58	21.3	26.8	41.87	23.5	25.9	53.92	45.7
27.1	43.75	28.0	27.3	55.26	21.5	27.8	42.18	23.4	26.9	54.66	45.5
28.1	43.13	27.8	28.3	54.96	21.7	28.8	42.48	23.2	27.9	55.37	45.3
29.1	42.49	27.6	29.3	54.66	21.9	29.8	42.80	23.1	28.9	56.07	45.1
									29.9	56.80	44.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Mar.	^h 1 ^m 17	+88° 43'	Mar.	^h 6 ^m 48	+87° 13'	Mar.	^h 18 ^m 7	+86° 36'	Mar.	^h 19 ^m 32	+88° 57'
	^s	"		^s	"		^s	"		^s	"
1.1	42.49	27.6	1.3	54.66	21.9	1.8	42.80	23.1	1.9	56.80	44.8
2.1	41.81	27.4	2.3	54.32	22.1	2.8	43.12	22.9	2.9	57.58	44.6
3.1	41.10	27.2	3.3	53.98	22.3	3.8	43.48	22.7	3.9	58.39	44.3
4.1	40.36	26.9	4.3	53.61	22.5	4.8	43.84	22.6	4.9	59.30	44.0
5.1	39.65	26.7	5.3	53.21	22.7	5.8	44.22	22.4	5.9	60.27	43.8
6.1	38.99	26.4	6.3	52.79	22.9	6.8	44.60	22.3	6.9	61.28	43.6
7.1	38.37	26.1	7.3	52.35	23.0	7.8	44.99	22.2	7.9	62.34	43.4
8.1	37.83	25.8	8.3	51.91	23.2	8.8	45.36	22.2	8.9	63.41	43.2
9.1	37.35	25.5	9.3	51.48	23.3	9.8	45.74	22.1	9.9	64.45	43.0
10.1	36.94	25.3	10.3	51.07	23.4	10.8	46.10	22.1	10.8	65.45	42.9
11.1	36.57	25.0	11.3	50.67	23.5	11.8	46.43	22.0	11.8	66.41	42.7
12.1	36.22	24.7	12.3	50.32	23.6	12.8	46.76	22.0	12.8	67.31	42.6
13.1	35.86	24.4	13.3	49.97	23.7	13.8	47.07	21.9	13.8	68.17	42.4
14.1	35.47	24.2	14.3	49.63	23.8	14.8	47.38	21.9	14.8	69.01	42.3
15.1	35.04	23.9	15.3	49.28	23.9	15.8	47.70	21.8	15.8	69.89	42.1
16.1	34.58	23.7	16.3	48.93	24.0	16.7	48.04	21.7	16.8	70.79	41.9
17.1	34.08	23.4	17.3	48.54	24.1	17.7	48.40	21.6	17.8	71.78	41.8
18.1	33.59	23.1	18.3	48.14	24.3	18.7	48.78	21.6	18.8	72.82	41.6
19.1	33.12	22.8	19.3	47.69	24.4	19.7	49.16	21.5	19.8	73.94	41.4
20.1	32.69	22.5	20.3	47.23	24.5	20.7	49.56	21.5	20.8	75.11	41.3
21.1	32.34	22.2	21.3	46.75	24.5	21.7	49.94	21.5	21.8	76.31	41.1
22.1	32.04	21.9	22.3	46.28	24.6	22.7	50.34	21.6	22.8	77.51	41.0
23.1	31.82	21.5	23.3	45.83	24.6	23.7	50.70	21.6	23.8	78.69	40.9
24.0	31.64	21.2	24.3	45.40	24.6	24.7	51.05	21.6	24.8	79.81	40.9
25.0	31.51	20.9	25.3	44.98	24.6	25.7	51.39	21.7	25.8	80.88	40.8
26.0	31.38	20.6	26.3	44.58	24.6	26.7	51.73	21.7	26.8	81.91	40.8
27.0	31.24	20.3	27.3	44.20	24.7	27.7	52.04	21.7	27.8	82.91	40.7
28.0	31.07	20.1	28.3	43.84	24.7	28.7	52.38	21.8	28.8	83.91	40.6
29.0	30.87	19.8	29.3	43.45	24.7	29.7	52.72	21.8	29.8	84.93	40.5
30.0	30.65	19.5	30.3	43.05	24.8	30.7	53.07	21.8	30.8	86.01	40.4
31.0	30.40	19.2	31.3	42.63	24.8	31.7	53.44	21.8	31.8	87.16	40.3
32.0	30.15	18.9	32.3	42.19	24.9	32.7	53.81	21.8	32.8	88.34	40.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (Hæv.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Apr.	^h 1 ^m 17	+88° 43'	Apr.	^h 6 ^m 48	+87° 13'	Apr.	^h 18 ^m 7	+86° 36'	Apr.	^h 19 ^m 33	+88° 57'
1.0	30.15	18.9	1.3	42.19	24.9	1.7	53.81	21.8	1.8	28.34	40.2
2.0	29.95	18.6	2.3	41.72	24.9	2.7	54.21	21.9	2.8	29.58	40.1
3.0	29.79	18.2	3.2	41.26	24.9	3.7	54.58	21.9	3.8	30.85	40.0
4.0	29.70	17.9	4.2	40.78	24.9	4.7	54.96	22.0	4.8	32.12	40.0
5.0	29.70	17.5	5.2	40.32	24.8	5.7	55.33	22.2	5.8	33.36	40.0
6.0	29.76	17.2	6.2	39.86	24.8	6.7	55.68	22.3	6.8	34.57	40.0
7.0	29.87	16.9	7.2	39.45	24.7	7.7	56.01	22.4	7.8	35.70	40.0
8.0	30.00	16.6	8.2	39.06	24.7	8.7	56.31	22.5	8.8	36.79	40.0
9.0	30.14	16.3	9.2	38.69	24.6	9.7	56.61	22.7	9.8	37.82	40.1
10.0	30.27	16.0	10.2	38.34	24.5	10.7	56.90	22.8	10.8	38.79	40.1
11.0	30.34	15.7	11.2	37.99	24.5	11.7	57.18	22.9	11.8	39.78	40.1
12.0	30.40	15.5	12.2	37.64	24.4	12.7	57.48	23.0	12.8	40.79	40.1
13.0	30.42	15.2	13.2	37.28	24.4	13.7	57.80	23.0	13.8	41.84	40.0
14.0	30.42	14.9	14.2	36.89	24.3	14.7	58.12	23.1	14.8	42.94	40.0
15.0	30.44	14.6	15.2	36.48	24.3	15.7	58.46	23.2	15.8	44.12	40.0
16.0	30.50	14.3	16.2	36.04	24.3	16.7	58.80	23.4	16.7	45.32	40.0
17.0	30.61	14.0	17.2	35.59	24.2	17.7	59.13	23.5	17.7	46.56	40.1
18.0	30.79	13.7	18.2	35.16	24.1	18.7	59.46	23.7	18.7	47.80	40.1
19.0	31.04	13.3	19.2	34.71	24.0	19.7	59.79	23.9	19.7	49.02	40.2
20.0	31.36	13.0	20.2	34.30	23.8	20.7	60.09	24.1	20.7	50.17	40.3
21.0	31.70	12.7	21.2	33.93	23.6	21.7	60.36	24.3	21.7	51.28	40.4
22.0	32.09	12.4	22.2	33.57	23.5	22.7	60.62	24.5	22.7	52.32	40.5
23.0	32.45	12.1	23.2	33.23	23.3	23.7	60.87	24.7	23.7	53.32	40.6
24.0	32.78	11.9	24.2	32.92	23.2	24.7	61.12	24.9	24.7	54.27	40.7
25.0	33.10	11.6	25.2	32.60	23.1	25.7	61.39	25.1	25.7	55.24	40.7
26.0	33.36	11.4	26.2	32.27	23.0	26.7	61.65	25.2	26.7	56.23	40.8
27.0	33.61	11.1	27.2	31.93	22.9	27.7	61.93	25.4	27.7	57.28	40.9
28.0	33.85	10.9	28.2	31.57	22.7	28.7	62.22	25.5	28.7	58.37	40.9
29.0	34.10	10.5	29.2	31.19	22.6	29.7	62.52	25.7	29.7	59.49	41.0
30.0	34.40	10.3	30.2	30.80	22.5	30.6	62.81	25.9	30.7	60.64	41.1
31.0	34.77	10.0	31.2	30.42	22.3	31.6	63.10	26.2	31.7	61.81	41.2
31.9	35.22	9.6									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
May	^h ^m 1 17	+88° 43'	May	^h ^m 6 48	+87° 13'	May	^h ^m 18 8	+86° 36'	May	^h ^m 19 34	+88° 57'
	^s	"		^s	"		^s	"		^s	"
1.9	35.22	9.6	1.2	30.42	22.3	1.6	3.10	26.2	1.7	1.81	47.2
2.9	35.72	9.3	2.2	30.03	22.1	2.6	3.37	26.4	2.7	2.94	41.4
3.9	36.28	9.1	3.2	29.66	21.9	3.6	3.62	26.7	3.7	4.04	41.5
4.9	36.88	8.8	4.2	29.33	21.7	4.6	3.85	27.0	4.7	5.05	41.7
5.9	37.48	8.6	5.2	29.02	21.5	5.6	4.05	27.2	5.7	6.01	41.9
6.9	38.08	8.4	6.2	28.75	21.3	6.6	4.24	27.5	6.7	6.88	42.1
7.9	38.64	8.2	7.2	28.51	21.1	7.6	4.43	27.7	7.7	7.70	42.2
8.9	39.16	8.0	8.2	28.27	20.9	8.6	4.59	27.9	8.7	8.48	42.4
9.9	39.64	7.8	9.1	28.03	20.7	9.6	4.77	28.2	9.7	9.28	42.5
10.9	40.09	7.6	10.1	27.79	20.5	10.6	4.96	28.4	10.7	10.11	42.7
11.9	40.54	7.3	11.1	27.54	20.4	11.6	5.16	28.6	11.7	10.99	42.8
12.9	41.02	7.1	12.1	27.25	20.2	12.6	5.38	28.8	12.7	11.89	43.0
13.9	41.55	6.8	13.1	26.96	20.0	13.6	5.58	29.1	13.7	12.85	43.1
14.9	42.12	6.6	14.1	26.66	19.8	14.6	5.80	29.3	14.7	13.84	43.3
15.9	42.77	6.3	15.1	26.34	19.6	15.6	6.00	29.6	15.7	14.83	43.5
16.9	43.48	6.1	16.1	26.05	19.3	16.6	6.19	29.9	16.7	15.79	43.7
17.9	44.24	5.9	17.1	25.77	19.1	17.6	6.35	30.2	17.7	16.71	43.9
18.9	45.03	5.7	18.1	25.53	18.8	18.6	6.50	30.5	18.7	17.54	44.2
29.9	45.81	5.5	19.1	25.31	18.5	19.6	6.64	30.8	19.7	18.30	44.4
20.9	46.57	5.3	20.1	25.12	18.2	20.6	6.76	31.1	20.7	19.01	44.6
21.9	47.28	5.2	21.1	24.94	18.0	21.6	6.87	31.4	21.7	19.69	44.9
22.9	47.94	5.0	22.1	24.80	17.7	22.6	6.97	31.7	22.6	20.32	45.1
23.9	48.59	4.9	23.1	24.64	17.5	23.6	7.09	31.9	23.6	20.97	45.3
24.9	49.19	4.7	24.1	24.45	17.3	24.6	7.20	32.2	24.6	21.65	45.5
25.9	49.82	4.5	25.1	24.26	17.0	25.6	7.33	32.5	25.6	22.38	45.7
26.9	50.46	4.3	26.1	24.06	16.8	26.6	7.47	32.7	26.6	23.14	45.9
27.9	51.17	4.1	27.1	23.83	16.6	27.6	7.62	33.0	27.6	23.96	46.1
28.9	51.93	3.9	28.1	23.62	16.3	28.6	7.75	33.3	28.6	24.72	46.3
29.9	52.77	3.7	29.1	23.40	16.1	29.6	7.88	33.6	29.6	25.50	46.6
30.9	53.67	3.6	30.1	23.21	15.8	30.6	7.98	34.0	30.6	26.24	46.9
31.9	54.58	3.4	31.1	23.04	15.5	31.6	8.06	34.3	31.6	26.90	47.2
32.9	55.48	3.3	32.1	22.90	15.1	32.6	8.11	34.6	32.6	27.49	47.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (Hrv.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
June	^h ^m 1 17	+88° 43'	June	^h ^m 6 48	+87° 13'	June	^h ^m 18 8	+86° 36'	June	^h ^m 19 34	+86° 57'
1.9	55.48	3.3	1.1	22.90	15.1	1.6	8.11	34.6	1.6	27.49	47.4
2.9	56.33	3.2	2.1	22.80	14.8	2.6	8.15	35.0	2.6	27.99	47.7
3.9	57.15	3.1	3.1	22.73	14.5	3.6	8.16	35.3	3.6	28.42	48.0
4.8	57.98	3.1	4.1	22.67	14.2	4.6	8.18	35.6	4.6	28.81	48.3
5.8	58.80	3.0	5.1	22.63	14.0	5.6	8.18	35.9	5.6	29.17	48.6
6.8	59.62	2.9	6.1	22.59	13.7	6.5	8.20	36.1	6.6	29.55	48.8
7.8	60.44	2.8	7.1	22.53	13.4	7.5	8.22	36.4	7.6	29.97	49.1
8.8	61.33	2.7	8.1	22.45	13.2	8.5	8.25	36.7	8.6	30.43	49.3
9.8	62.23	2.6	9.1	22.36	12.9	9.5	8.30	37.0	9.6	30.93	49.6
10.8	63.12	2.5	10.1	22.25	12.7	10.5	8.34	37.3	10.6	31.44	49.8
11.8	64.02	2.4	11.1	22.14	12.4	11.5	8.38	37.6	11.6	31.96	50.1
12.8	64.91	2.2	12.1	22.04	12.1	12.5	8.40	37.9	12.6	32.48	50.4
13.8	65.81	2.2	13.1	21.96	11.8	13.5	8.41	38.3	13.6	32.94	50.7
14.8	66.70	2.1	14.1	21.90	11.4	14.5	8.39	38.7	14.6	33.33	51.1
15.8	67.59	2.0	15.1	21.87	11.1	15.5	8.35	39.0	15.6	33.65	51.4
16.8	68.49	2.0	16.0	21.88	10.7	16.5	8.30	39.3	16.6	33.90	51.7
17.8	69.38	2.0	17.0	21.91	10.4	17.5	8.23	39.7	17.6	34.09	52.1
18.8	70.31	2.0	18.0	21.96	10.1	18.5	8.17	40.0	18.6	34.25	52.4
19.8	71.25	1.9	19.0	22.00	9.8	19.5	8.11	40.2	19.6	34.39	52.6
20.8	72.19	1.9	20.0	22.04	9.5	20.5	8.05	40.5	20.6	34.56	52.9
21.8	73.13	1.9	21.0	22.05	9.3	21.5	8.01	40.8	21.6	34.76	53.2
22.8	74.07	1.9	22.0	22.07	9.0	22.5	7.97	41.1	22.6	35.01	53.4
23.8	75.01	1.8	23.0	22.06	8.7	23.5	7.93	41.3	23.6	35.29	53.7
24.8	75.95	1.7	24.0	22.04	8.4	24.5	7.89	41.7	24.6	35.57	54.0
25.8	76.89	1.7	25.0	22.02	8.1	25.5	7.85	42.0	25.6	35.85	54.3
26.8	77.83	1.7	26.0	22.04	7.8	26.5	7.77	42.3	26.6	36.08	54.7
27.8	78.77	1.7	27.0	22.06	7.5	27.5	7.69	42.7	27.6	36.25	55.0
28.8	79.72	1.7	28.0	22.12	7.1	28.5	7.58	43.0	28.5	36.34	55.4
29.8	80.68	1.7	29.0	22.21	6.8	29.5	7.44	43.4	29.5	36.35	55.7
30.8	81.64	1.8	30.0	22.34	6.5	30.5	7.29	43.7	30.5	36.28	56.1
31.8	82.60	1.8	31.0	22.49	6.1	31.5	7.13	44.0	31.5	36.15	56.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
July	^h 1 ^m 18	+88° 43'	July	^h 6 ^m 48	+87° 12'	July	^h 18 ^m 8	+86° 36'	July	^h 19 ^m 34	+88° 57'
1.8	22.60	" 1.8	1.0	22.49	66.1	1.5	7.13	44.0	1.5	36.15	56.4
2.8	23.56	1.9	2.0	22.64	65.8	2.5	6.96	44.3	2.5	35.99	56.8
3.8	24.52	2.0	3.0	22.81	65.5	3.5	6.79	44.5	3.5	35.82	57.1
4.8	25.48	2.1	4.0	22.98	65.3	4.5	6.64	44.8	4.5	35.67	57.4
5.8	26.44	2.1	5.0	23.11	65.0	5.5	6.49	45.1	5.5	35.58	57.6
6.8	27.40	2.2	6.0	23.24	64.7	6.5	6.37	45.3	6.5	35.53	57.9
7.8	28.36	2.2	7.0	23.35	64.5	7.5	6.25	45.6	7.5	35.49	58.2
8.8	29.32	2.2	8.0	23.44	64.2	8.5	6.10	45.9	8.5	35.48	58.6
9.8	30.27	2.3	9.0	23.55	63.9	9.5	5.96	46.2	9.5	35.45	58.9
10.8	31.23	2.3	10.0	23.66	63.5	10.5	5.80	46.5	10.5	35.39	59.2
11.7	32.18	2.4	11.0	23.80	63.2	11.5	5.63	46.9	11.5	35.25	59.6
12.7	33.14	2.5	12.0	23.97	62.9	12.4	5.44	47.2	12.5	35.06	60.0
13.7	34.10	2.6	13.0	24.18	62.5	13.4	5.22	47.5	13.5	34.82	60.3
14.7	35.05	2.7	14.0	24.41	62.2	14.4	5.00	47.8	14.5	34.43	60.7
15.7	36.01	2.8	15.0	24.66	61.9	15.4	4.76	48.1	15.5	34.05	61.0
16.7	36.96	3.0	16.0	24.90	61.6	16.4	4.53	48.3	16.5	33.64	61.3
17.7	37.92	3.1	17.0	25.16	61.4	17.4	4.31	48.6	17.5	33.24	61.6
18.7	38.85	3.2	18.0	25.40	61.1	18.4	4.09	48.8	18.5	32.88	61.9
19.7	39.78	3.3	19.0	25.62	60.8	19.4	3.89	49.0	19.5	32.56	62.2
20.7	40.71	3.4	20.0	25.82	60.6	20.4	3.68	49.3	20.5	32.26	62.5
21.7	41.64	3.5	20.9	26.01	60.3	21.4	3.49	49.5	21.5	31.99	62.7
22.7	42.57	3.6	21.9	26.19	60.1	22.4	3.28	49.8	22.5	31.72	63.1
23.7	43.51	3.7	22.9	26.39	59.8	23.4	3.09	50.1	23.5	31.43	63.4
24.7	44.44	3.9	23.9	26.61	59.5	24.4	2.86	50.4	24.5	31.08	63.7
25.7	45.37	4.0	24.9	26.85	59.2	25.4	2.60	50.6	25.5	30.65	64.1
26.7	46.30	4.2	25.9	27.13	58.8	26.4	2.31	50.9	26.5	30.15	64.4
27.7	47.23	4.4	26.9	27.43	58.5	27.4	2.00	51.2	27.5	29.57	64.8
28.7	48.12	4.6	27.9	27.77	58.2	28.4	1.69	51.5	28.5	28.91	65.1
29.7	49.00	4.8	28.9	28.12	57.9	29.4	1.36	51.7	29.5	28.21	65.5
30.7	49.89	5.0	29.9	28.48	57.7	30.4	1.04	51.9	30.5	27.49	65.8
31.7	50.77	5.2	30.9	28.83	57.4	31.4	0.73	52.1	31.5	26.79	66.0
32.7	51.66	5.4	31.9	29.17	57.2	32.4	0.43	52.3	32.5	26.15	66.3
			32.9	29.50	57.0						

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Aug.	^h 1 ^m 18	+88° 43'	Aug.	^h 6 ^m 48	+87° 12'	Aug.	^h 18 ^m 7	+86° 36'	Aug.	^h 19 ^m 33	+88° 58'
1.7	51.66	5.4	1.9	29.50	57.0	1.4	60.43	52.3	1.5	86.15	6.3
2.7	52.50	5.6	2.9	29.79	56.8	2.4	60.16	52.5	2.5	85.52	6.6
3.7	53.29	5.8	3.9	30.08	56.5	3.4	59.88	52.7	3.5	84.95	6.9
4.7	54.12	6.0	4.9	30.36	56.3	4.4	59.61	52.9	4.4	84.39	7.2
5.7	54.99	6.1	5.9	30.65	56.0	5.4	59.33	53.1	5.4	83.84	7.4
6.7	55.92	6.3	6.9	30.96	55.7	6.4	59.04	53.4	6.4	83.27	7.8
7.7	56.86	6.5	7.9	31.31	55.5	7.4	58.73	53.6	7.4	82.65	8.1
8.7	57.83	6.7	8.9	31.67	55.2	8.4	58.40	53.9	8.4	81.94	8.4
9.7	58.77	7.0	9.9	32.07	54.9	9.4	58.06	54.1	9.4	81.18	8.8
10.7	59.67	7.2	10.9	32.47	54.6	10.4	57.70	54.3	10.4	80.34	9.1
11.7	60.53	7.5	11.9	32.89	54.4	11.4	57.34	54.5	11.4	79.45	9.4
13.7	61.30	7.8	12.9	33.33	54.2	12.4	56.98	54.7	12.4	78.53	9.7
13.7	62.04	8.0	13.9	33.73	54.0	13.4	56.62	54.9	13.4	77.63	9.9
14.7	62.72	8.3	14.9	34.12	53.8	14.4	56.27	55.0	14.4	76.74	10.2
15.7	63.39	8.5	15.9	34.49	53.6	15.4	55.94	55.1	15.4	75.90	10.4
16.6	64.07	8.8	16.9	34.85	53.4	16.4	55.61	55.3	16.4	75.10	10.7
17.6	64.78	9.0	17.9	35.20	53.2	17.4	55.30	55.4	17.4	74.34	10.9
18.6	65.51	9.2	18.9	35.55	53.0	18.3	54.96	55.6	18.4	73.59	11.2
19.6	66.32	9.5	19.9	35.92	52.8	19.3	54.63	55.8	19.4	72.82	11.5
20.6	67.15	9.7	20.9	36.31	52.6	20.3	54.28	56.0	20.4	72.00	11.7
21.6	68.01	9.9	21.9	36.73	52.3	21.3	53.93	56.2	21.4	71.13	12.0
22.6	68.87	10.2	22.9	37.18	52.1	22.3	53.53	56.4	22.4	70.19	12.3
23.6	69.69	10.5	23.9	37.65	51.9	23.3	53.13	56.5	23.4	69.15	12.6
24.6	70.49	10.9	24.9	38.15	51.6	24.3	52.71	56.7	24.4	68.06	12.9
25.6	71.20	11.2	25.8	38.66	51.5	25.3	52.28	56.8	25.4	66.92	13.2
26.6	71.87	11.5	26.8	39.15	51.3	26.3	51.85	56.9	26.4	65.74	13.4
27.6	72.48	11.9	27.8	39.64	51.1	27.3	51.44	57.0	27.4	64.59	13.7
28.6	73.04	12.2	28.8	40.11	51.0	28.3	51.04	57.1	28.4	63.45	13.9
29.6	73.58	12.5	29.8	40.55	50.9	29.3	50.66	57.2	29.4	62.39	14.1
30.6	74.13	12.8	30.8	40.98	50.7	30.3	50.29	57.3	30.4	61.36	14.3
31.6	74.72	13.0	31.8	41.39	50.6	31.3	49.92	57.4	31.4	60.36	14.5
32.6	75.34	13.3	32.8	41.82	50.4	32.3	49.55	57.5	32.4	59.38	14.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	<i>δ</i> Ursæ Minoris.		Mean Solar Date.	<i>λ</i> Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Sept.	^h ^m 1 19	+88° 43'	Sept.	^h ^m 6 48	+87° 12'	Sept.	^h ^m 18 7	+86° 36'	Sept.	^h ^m 19 33	+88° 58'
1.6	^s 15.34	13.3	1.8	^s 41.82	50.4	1.3	^s 49.55	57.5	1.4	^s 59.38	14.7
2.6	16.01	13.6	2.8	42.23	50.2	2.3	49.17	57.6	2.4	58.40	15.0
3.6	16.71	13.9	3.8	42.69	50.0	3.3	48.79	57.8	3.4	57.38	15.2
4.6	17.42	14.2	4.8	43.17	49.8	4.3	48.38	57.9	4.4	56.29	15.5
5.6	18.13	14.6	5.8	43.69	49.6	5.3	47.96	58.1	5.4	55.14	15.7
6.6	18.80	14.9	6.8	44.22	49.5	6.3	47.51	58.2	6.4	53.92	16.0
7.6	19.40	15.3	7.8	44.76	49.3	7.3	47.08	58.3	7.4	52.66	16.2
8.6	19.96	15.6	8.8	45.29	49.2	8.3	46.63	58.3	8.4	51.35	16.4
9.6	20.43	16.0	9.8	45.83	49.1	9.3	46.20	58.4	9.4	50.04	16.6
10.6	20.88	16.4	10.8	46.35	49.0	10.3	45.77	58.4	10.3	48.75	16.8
11.6	21.27	16.7	11.8	46.84	48.9	11.3	45.36	58.4	11.3	47.53	16.9
12.6	21.65	17.0	12.8	47.31	48.8	12.3	44.96	58.4	12.3	46.32	17.1
13.6	22.06	17.3	13.8	47.76	48.7	13.3	44.57	58.5	13.3	45.16	17.2
14.6	22.50	17.7	14.8	48.21	48.6	14.3	44.18	58.5	14.3	44.05	17.4
15.6	23.00	18.0	15.8	48.67	48.5	15.3	43.79	58.6	15.3	42.94	17.6
16.6	23.52	18.3	16.8	49.14	48.4	16.3	43.39	58.6	16.3	41.80	17.8
17.6	24.07	18.6	17.8	49.64	48.3	17.3	42.97	58.7	17.3	40.61	18.0
18.6	24.64	19.0	18.8	50.16	48.1	18.3	42.52	58.8	18.3	39.34	18.2
19.6	25.18	19.4	19.8	50.72	48.0	19.3	42.08	58.8	19.3	38.02	18.4
20.6	25.69	19.7	20.8	51.29	47.9	20.3	41.61	58.9	20.3	36.64	18.5
21.6	26.13	20.1	21.8	51.88	47.8	21.3	41.14	58.9	21.3	35.19	18.7
22.5	26.50	20.5	22.8	52.46	47.7	22.3	40.66	58.9	22.3	33.71	18.9
23.5	26.79	20.9	23.8	53.03	47.7	23.3	40.20	58.8	23.3	32.22	19.0
24.5	27.05	21.3	24.8	53.58	47.7	24.2	39.74	58.8	24.3	30.79	19.1
25.5	27.27	21.7	25.8	54.11	47.7	25.2	39.31	58.7	25.3	29.41	19.2
26.5	27.48	22.1	26.8	54.63	47.6	26.2	38.90	58.7	26.3	28.06	19.3
27.5	27.72	22.4	27.8	55.10	47.6	27.2	38.50	58.7	27.3	26.76	19.4
28.5	27.99	22.8	28.8	55.59	47.6	28.2	38.10	58.6	28.3	25.50	19.5
29.5	28.30	23.1	29.8	56.08	47.5	29.2	37.69	58.6	29.3	24.25	19.6
30.5	28.64	23.5	30.8	56.59	47.4	30.2	37.27	58.6	30.3	22.99	19.8
31.5	29.00	23.8	31.8	57.12	47.4	31.2	36.85	58.6	31.3	21.68	19.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (Hæv.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Oct.	^h 1 ^m 19	+88° 43'	Oct.	^h 6 ^m 48	+87° 12'	Oct.	^h 18 ^m 7	+86° 36'	Oct.	^h 19 ^m 32	+88° 58'
	^s	"		^s	"		^s	"		^s	"
1.5	29.00	23.8	1.8	57.12	47.4	1.3	36.85	58.6	1.3	81.68	19.9
2.5	29.35	24.2	2.7	57.66	47.3	2.2	36.41	58.6	2.3	80.31	20.0
3.5	29.68	24.6	3.7	58.24	47.2	3.2	35.97	58.6	3.3	78.88	20.2
4.5	29.97	25.0	4.7	58.83	47.2	4.2	35.51	58.6	4.3	77.40	20.3
5.5	30.19	25.5	5.7	59.42	47.2	5.2	35.06	58.5	6.3	75.88	20.4
6.5	30.32	25.9	6.7	60.01	47.2	6.2	34.61	58.5	6.3	74.35	20.5
7.5	30.42	26.3	7.7	60.57	47.2	7.2	34.16	58.4	7.3	72.85	20.5
8.5	30.45	26.7	8.7	61.10	47.3	8.2	33.74	58.2	8.3	71.40	20.6
9.5	30.48	27.0	9.7	61.61	47.3	9.2	33.33	58.1	9.3	69.99	20.6
10.5	30.49	27.4	10.7	62.11	47.4	10.2	32.93	58.0	10.3	68.65	20.7
11.5	30.55	27.8	11.7	62.59	47.4	11.2	32.55	57.9	11.3	67.35	20.7
12.5	30.63	28.1	12.7	63.07	47.4	12.2	32.17	57.8	12.3	66.07	20.7
13.5	30.77	28.5	13.7	63.57	47.4	13.2	31.77	57.8	13.3	64.78	20.8
14.5	30.92	28.8	14.7	64.08	47.4	14.2	31.38	57.7	14.3	63.46	20.8
15.5	31.10	29.2	15.7	64.62	47.4	15.2	30.96	57.6	15.3	62.09	20.9
16.5	31.25	29.6	16.7	65.16	47.4	16.2	30.52	57.5	16.2	60.66	21.0
17.5	31.39	30.0	17.7	65.74	47.4	17.2	30.07	57.5	17.2	59.15	21.0
18.5	31.46	30.4	18.7	66.32	47.5	18.2	29.60	57.4	18.2	57.61	21.1
19.5	31.46	30.9	19.7	66.91	47.5	19.2	29.13	57.2	19.2	56.02	21.1
20.5	31.38	31.3	20.7	67.49	47.6	20.2	28.67	57.1	20.2	54.43	21.1
21.5	31.26	31.7	21.7	68.05	47.7	21.2	28.22	56.9	21.2	52.88	21.1
22.5	31.09	32.1	22.7	68.61	47.8	22.2	27.79	56.7	22.2	51.36	21.1
23.5	30.91	32.5	23.7	69.11	47.9	23.2	27.39	56.5	23.2	49.93	21.0
24.5	30.73	32.8	24.7	69.60	48.0	24.2	27.01	56.3	24.2	48.56	21.0
25.5	30.59	33.2	25.7	70.09	48.1	25.2	26.62	56.2	25.2	47.21	20.9
26.5	30.46	33.5	26.7	70.54	48.2	26.2	26.25	56.0	26.2	45.90	20.9
27.5	30.39	33.9	27.7	71.00	48.3	27.2	25.89	55.9	27.2	44.59	20.9
28.5	30.33	34.2	28.7	71.48	48.3	28.2	25.55	55.8	28.2	43.25	20.9
29.4	30.30	34.6	29.7	71.99	48.4	29.2	25.18	55.6	29.2	41.87	20.9
30.4	30.23	35.0	30.7	72.53	48.5	30.2	24.82	55.5	30.2	40.46	20.9
31.4	30.11	35.4	31.7	73.09	48.6	31.2	24.43	55.3	31.2	38.97	20.9
32.4	29.94	35.8	32.7	73.71	48.7	32.1	24.05	55.1	32.2	37.47	20.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Nov.	^h 1 ^m 19	+88° 43'	Nov.	^h 6 ^m 49	+87° 12'	Nov.	^h 18 ^m 7	+86° 36'	Nov.	^h 19 ^m 31	+88° 58'
1.4	29.94	35.8	1.7	13.71	48.7	1.1	24.05	55.1	1.2	97.47	20.9
2.4	29.71	36.2	2.7	14.26	48.8	2.1	23.67	54.9	2.2	96.95	20.8
3.4	29.41	36.6	3.7	14.80	49.0	3.1	23.30	54.7	3.2	94.44	20.7
4.4	29.05	37.0	4.7	15.30	49.1	4.1	22.95	54.5	4.2	92.99	20.6
5.4	28.65	37.4	5.7	15.78	49.3	5.1	22.64	54.2	5.2	91.60	20.5
6.4	28.26	37.7	6.7	16.22	49.5	6.1	22.31	54.0	6.2	90.25	20.4
7.4	27.87	38.0	7.7	16.66	49.6	7.1	21.99	53.7	7.2	89.00	20.3
8.4	27.53	38.4	8.6	17.07	49.8	8.1	21.68	53.5	8.2	87.76	20.2
9.4	27.24	38.7	9.6	17.50	49.9	9.1	21.38	53.3	9.2	86.54	20.1
10.4	26.96	39.0	10.6	17.94	50.1	10.1	21.06	53.1	10.2	85.32	20.0
11.4	26.70	39.3	11.6	18.40	50.2	11.1	20.74	52.9	11.2	84.06	19.9
12.4	26.45	39.7	12.6	18.87	50.3	12.1	20.39	52.7	12.2	82.75	19.9
13.4	26.17	40.1	13.6	19.38	50.4	13.1	20.04	52.5	13.2	81.40	19.8
14.4	25.85	40.4	14.6	19.89	50.6	14.1	19.70	52.3	14.2	79.97	19.7
15.4	25.45	40.8	15.6	20.41	50.8	15.1	19.34	52.0	15.2	78.52	19.6
16.4	25.00	41.2	16.6	20.92	51.0	16.1	19.00	51.8	16.2	77.07	19.4
17.4	24.46	41.6	17.6	21.40	51.2	17.1	18.66	51.5	17.2	75.63	19.3
18.4	23.89	41.9	18.6	21.85	51.5	18.1	18.34	51.2	18.2	74.26	19.1
19.4	23.30	42.3	19.6	22.27	51.7	19.1	18.05	50.9	19.2	72.96	18.9
20.4	22.69	42.6	20.6	22.67	51.9	20.1	17.80	50.6	20.2	71.74	18.8
21.4	22.11	42.9	21.6	23.05	52.2	21.1	17.53	50.3	21.1	70.56	18.6
22.4	21.57	43.2	22.6	23.42	52.4	22.1	17.29	50.0	22.1	69.44	18.4
23.4	21.05	43.5	23.6	23.79	52.6	23.1	17.06	49.7	23.1	68.34	18.2
24.4	20.59	43.8	24.6	24.17	52.8	24.1	16.81	49.5	24.1	67.24	18.1
25.4	20.12	44.1	25.6	24.57	52.9	25.1	16.56	49.2	25.1	66.10	18.0
26.4	19.66	44.4	26.6	24.99	53.1	26.1	16.30	49.0	26.1	64.92	17.8
27.4	19.15	44.7	27.6	25.43	53.3	27.1	16.02	48.7	27.1	63.73	17.7
28.4	18.59	45.0	28.6	25.86	53.6	28.1	15.77	48.4	28.1	62.46	17.5
29.4	17.98	45.3	29.6	26.27	53.8	29.1	15.50	48.1	29.1	61.21	17.3
30.4	17.29	45.7	30.6	26.69	54.1	30.1	15.24	47.8	30.1	59.97	17.1
31.4	16.55	46.0	31.6	27.06	54.4	31.1	15.01	47.5	31.1	58.78	16.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (Polaris.)		Mean Solar Date.	51 Cephei (Hrv.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Dec.	^h ^m 1 18	+86° 43'	Dec.	^h ^m 6 49	+87° 12'	Dec.	^h ^m 18 7	+86° 36'	Dec.	^h ^m 19 31	+88° 58'
1.4	^s 76.55	46.0	1.6	^s 27.06	54.4	1.1	^s 15.01	47.5	1.1	^s 58.78	16.8
2.4	75.76	46.3	2.6	27.41	54.7	2.1	14.80	47.1	2.1	57.64	16.6
3.4	74.96	46.5	3.6	27.73	55.0	3.1	14.63	46.8	3.1	56.59	16.3
4.3	74.18	46.8	4.6	28.02	55.2	4.1	14.43	46.4	4.1	55.61	16.1
5.3	73.41	47.0	5.6	28.29	55.5	5.0	14.27	46.1	5.1	54.69	15.8
6.3	72.71	47.2	6.6	28.57	55.8	6.0	14.11	45.8	6.1	53.79	15.6
7.3	72.03	47.4	7.6	28.85	56.0	7.0	13.96	45.5	7.1	52.92	15.4
8.3	71.41	47.7	8.6	29.15	56.3	8.0	13.79	45.2	8.1	52.01	15.2
9.3	70.77	47.9	9.6	29.45	56.5	9.0	13.61	44.9	9.1	51.07	15.0
10.3	70.13	48.2	10.6	29.79	56.7	10.0	13.43	44.6	10.1	50.10	14.8
11.3	69.45	48.4	11.6	30.13	57.0	11.0	13.23	44.3	11.1	49.07	14.6
12.3	68.79	48.7	12.6	30.47	57.3	12.0	13.04	44.0	12.1	48.01	14.3
13.3	67.93	49.0	13.6	30.81	57.6	13.0	12.85	43.7	13.1	46.97	14.1
14.3	67.07	49.2	14.5	31.13	57.9	14.0	12.66	43.3	14.1	45.92	13.8
15.3	66.15	49.5	15.5	31.41	58.2	15.0	12.51	42.9	15.1	44.93	13.6
16.3	65.21	49.7	16.5	31.66	58.6	16.0	12.40	42.5	16.1	44.03	13.2
17.3	64.26	49.9	17.5	31.88	58.9	17.0	12.28	42.2	17.1	43.20	12.9
18.3	63.33	50.1	18.5	32.08	59.2	18.0	12.20	41.8	18.1	42.45	12.6
19.3	62.45	50.3	19.5	32.25	59.5	19.0	12.13	41.5	19.1	41.77	12.3
20.3	61.60	50.4	20.5	32.42	59.8	20.0	12.06	41.1	20.1	41.12	12.0
21.3	60.78	50.6	21.5	32.60	60.1	21.0	12.00	40.8	21.1	40.49	11.8
22.3	59.99	50.7	22.5	32.80	60.4	22.0	11.93	40.5	22.1	39.84	11.5
23.3	59.23	50.9	23.5	33.01	60.6	23.0	11.84	40.2	23.1	39.17	11.3
24.3	58.43	51.1	24.5	33.24	60.9	24.0	11.76	39.9	24.1	38.44	11.0
25.3	57.60	51.3	25.5	33.47	61.2	25.0	11.68	39.6	25.1	37.70	10.7
26.3	56.72	51.5	26.5	33.68	61.5	26.0	11.60	39.3	26.1	36.95	10.5
27.3	55.77	51.6	27.5	33.89	61.9	27.0	11.52	38.8	27.1	36.21	10.1
28.3	54.77	51.8	28.5	34.08	62.2	28.0	11.47	38.5	28.1	35.51	9.8
29.3	53.72	52.0	29.5	34.22	62.6	29.0	11.44	38.1	29.1	34.87	9.5
30.3	52.66	52.1	30.5	34.33	63.0	30.0	11.42	37.7	30.1	34.33	9.1
31.3	51.61	52.2	31.5	34.41	63.3	31.0	11.43	37.3	31.1	33.85	8.8
32.3	50.58	52.3	32.5	34.48	63.7	32.0	11.46	36.9	32.1	33.46	8.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (Algenib.)		β Hydri.		12 Ceti.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h 0 ^m 2	+28° 28'	^h 0 ^m 7	+14° 34'	^h 0 ^m 19	-77° 52'	^h 0 ^m 24	- 4° 33'
(Dec.30.2)	^s 40.89 -14	60.8 -0.8	^s 33.10 -12	16.1 -0.7	^s 56.00 -90	52.8 +0.7	^s 24.39 -11	64.2 -0.7
Jan. 9.2	40.75 .14	59.9 1.1	32.98 .11	15.3 0.9	55.12 .85	51.7 1.3	24.28 .11	64.8 0.6
19.2	40.62 .13	58.7 1.3	32.87 .10	14.3 1.0	54.31 .78	50.1 1.9	24.17 .10	65.3 0.5
29.1	40.49 .11	57.3 1.5	32.77 .09	13.3 1.0	53.57 .68	47.9 2.4	24.07 .09	65.7 0.3
Feb. 8.1	40.39 .09	55.8 1.6	32.68 .07	12.3 1.0	52.94 .57	45.2 2.9	23.99 .08	66.0 -0.9
18.1	40.31 -.06	54.1 -1.6	32.62 -.05	11.3 -1.0	52.42 -.45	42.2 +3.2	23.92 -.06	66.1 0.0
28.1	40.27 -.03	52.5 1.6	32.58 -.02	10.3 0.9	52.04 .31	38.8 3.5	23.87 -.03	65.9 +0.2
Mar. 10.0	40.25 +.01	51.0 1.5	32.57 +.01	9.5 0.7	51.81 -.16	35.1 3.7	23.85 .00	65.6 0.4
20.0	40.28 .05	49.6 1.3	32.60 .05	8.9 0.5	51.73 .00	31.4 3.8	23.87 +.03	65.1 0.7
30.0	40.36 .10	48.4 1.0	32.67 .09	8.5 -0.2	51.81 +.16	27.5 3.8	23.92 .07	64.3 0.9
Apr. 9.0	40.48 +.15	47.5 -0.7	32.78 +.13	8.4 0.0	52.04 +.31	23.7 +3.8	24.01 +.11	63.3 +1.1
19.0	40.65 .19	46.9 -0.4	32.93 .17	8.6 +0.3	52.43 .47	19.9 3.7	24.14 .15	62.0 1.4
28.9	40.86 .23	46.7 0.0	33.13 .21	9.1 0.7	52.97 .61	16.3 3.5	24.32 .19	60.5 1.6
May 8.9	41.11 .27	46.9 +0.4	33.36 .25	9.9 1.0	53.66 .75	13.0 3.2	24.53 .23	58.8 1.8
18.9	41.40 .30	47.4 0.8	33.62 .28	11.0 1.3	54.47 .87	10.0 2.8	24.77 .26	57.0 1.9
28.8	41.71 +.22	48.4 +1.1	33.91 +.30	12.5 +1.5	55.39 +.97	7.3 +2.4	25.04 +.28	55.0 +2.0
June 7.8	42.04 .34	49.7 1.5	34.22 .31	14.1 1.8	56.40 1.05	5.2 1.9	25.34 .30	52.9 2.1
17.8	42.38 .34	51.3 1.8	34.54 .32	16.0 1.9	57.49 1.10	3.4 1.4	25.65 .31	50.8 2.1
27.7	42.72 .34	53.3 2.0	34.86 .32	18.0 2.1	58.61 1.13	2.3 0.9	25.97 .32	48.7 2.1
July 7.7	43.06 .33	55.4 2.2	35.18 .31	20.1 2.1	59.75 1.13	1.7 +0.3	26.28 .31	46.7 2.0
17.7	43.38 +.31	57.8 +2.4	35.48 +.29	22.3 +2.2	60.87 +1.09	1.7 -0.3	26.59 +.30	44.8 +1.8
27.7	43.67 .28	60.2 2.5	35.76 .27	24.5 2.1	61.94 1.03	2.2 0.8	26.88 .28	43.1 1.6
Aug. 6.6	43.93 .25	62.8 2.5	36.02 .24	26.6 2.1	62.93 .94	3.3 1.3	27.14 .25	41.6 1.4
16.6	44.16 .21	65.3 2.5	36.24 .20	28.6 2.0	63.81 .81	4.9 1.8	27.38 .22	40.4 1.1
26.6	44.35 .17	67.8 2.4	36.42 .17	30.5 1.8	64.55 .67	7.0 2.3	27.58 .18	39.4 0.8
Sept. 5.6	44.50 +.13	70.1 +2.3	36.57 +.13	32.1 +1.6	65.14 +.52	9.4 -2.6	27.74 +.15	38.7 +0.6
15.5	44.61 .09	72.4 2.2	36.68 .09	33.7 1.4	65.55 .32	12.2 2.9	27.87 .11	38.3 +0.3
25.5	44.67 .05	74.5 2.0	36.76 .06	35.0 1.2	65.77 +.13	15.2 3.0	27.96 .07	38.1 0.0
Oct. 5.5	44.70 +.01	76.4 1.8	36.79 +.02	36.1 1.0	65.81 -.06	18.2 3.0	28.02 .04	38.2 -0.2
15.5	44.70 -.02	78.0 1.5	36.80 -.01	37.0 0.8	65.65 .24	21.2 2.9	28.04 +.01	38.5 0.4
25.4	44.66 -.05	79.4 +1.2	36.78 -.04	37.6 +0.5	65.32 -.42	24.1 -2.7	28.03 -.02	38.9 -0.5
Nov. 4.4	44.60 .07	80.5 1.0	36.73 .06	38.0 0.3	64.82 .57	26.7 2.4	28.00 .04	39.5 0.6
14.4	44.51 .10	81.3 0.7	36.66 .06	38.2 +0.1	64.18 .70	28.8 2.0	27.95 .06	40.2 0.7
24.3	44.40 .12	81.8 +0.4	36.57 .09	38.2 -0.1	63.43 .80	30.6 1.5	27.88 .06	40.9 0.7
Dec. 4.3	44.22 .13	82.0 0.0	36.47 .10	38.0 0.3	62.59 .87	31.8 0.9	27.79 .09	41.7 0.8
14.3	44.15 -.13	81.9 -0.3	36.36 -.11	37.6 -0.5	61.70 -.90	32.3 -0.3	27.69 -.10	42.5 -0.7
24.3	44.01 .14	81.5 0.6	36.25 .11	37.0 0.7	60.79 .90	32.2 +0.3	27.59 .10	43.2 0.7
34.2	43.87 -.14	80.7 -0.9	36.14 -.12	36.3 -0.8	59.89 -.88	31.5 +1.0	27.48 -.11	43.8 -0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cassiope.		β Ceti.		21 Cassiope.		ϵ Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 0 34	^m +55° 55'	^h 0 38	^m -18° 35'	^h 0 38	^m +74° 22'	^h 0 57	^m + 7° 17'
(Dec. 30.3)	15.00 - .20	71.4 - 0.1	3.08 - .12	40.7 - 0.6	22.20 - .71	84.6 + 0.3	13.13 - .11	46.4 - 0.6
Jan. 9.2	14.70 .29	71.0 0.7	2.96 .12	41.1 0.3	21.47 .72	84.6 - 0.3	13.01 .12	45.7 0.7
19.2	14.41 .28	70.1 1.2	2.84 .12	41.4 - 0.1	20.74 .71	84.0 0.9	12.90 .12	45.0 0.7
29.2	14.13 .27	68.7 1.6	2.73 .11	41.3 + 0.2	20.05 .66	82.8 1.5	12.78 .11	44.4 0.7
Feb. 8.1	13.88 .24	66.9 1.9	2.63 .09	41.0 0.5	19.41 .59	81.0 2.0	12.67 .10	43.7 0.6
18.1	13.66 - .19	64.8 - 2.2	2.54 - .07	40.4 + 0.7	18.86 - .49	78.9 - 2.4	12.57 - .09	43.2 - 0.5
28.1	13.49 .14	62.5 2.4	2.46 .06	39.6 1.0	18.43 .38	76.3 2.7	12.49 .06	42.7 0.4
Mar. 10.1	13.38 .09	60.0 2.5	2.44 - .08	38.4 1.3	18.11 .24	73.5 2.9	12.44 - .03	42.4 - 0.2
20.0	13.34 - .01	57.5 2.5	2.44 + .02	37.1 1.5	17.95 - .09	70.6 3.0	12.43 .00	42.2 0.0
30.0	13.37 + .07	55.0 2.4	2.46 .06	35.5 1.7	17.93 + .06	67.6 2.9	12.44 + .04	42.3 + 0.2
Apr. 9.0	13.48 + .14	52.7 - 2.1	2.56 + .10	33.6 + 1.9	18.07 + .28	64.8 - 2.7	12.50 + .08	42.6 + 0.4
19.0	13.66 .21	50.7 1.8	2.68 .14	31.6 2.1	18.36 .36	62.1 2.5	12.61 .12	43.2 0.7
28.9	13.91 .26	49.1 1.4	2.84 .18	29.4 2.2	18.80 .50	59.6 2.1	12.75 .17	44.0 0.9
May 8.9	14.22 .34	47.8 1.0	3.05 .22	27.1 2.3	19.36 .61	57.9 1.7	12.94 .21	45.0 1.2
18.9	14.59 .39	47.0 - 0.5	3.29 .26	24.7 2.4	20.03 .71	56.4 1.9	13.16 .24	46.4 1.4
28.9	15.01 + .42	46.8 0.0	3.56 + .28	22.3 + 2.4	20.79 + .79	55.5 - 0.7	13.42 + .27	47.9 + 1.6
June 7.8	15.46 .46	47.0 + 0.5	3.86 .31	19.9 2.3	21.61 .84	55.1 - 0.1	13.70 .29	49.6 1.8
17.8	15.93 .47	47.7 0.9	4.17 .32	17.6 2.2	22.47 .87	55.2 + 0.4	14.01 .31	51.5 1.9
27.8	16.41 .48	48.8 1.4	4.50 .33	15.5 2.0	23.35 .87	55.9 0.9	14.32 .32	53.5 2.0
July 7.7	16.88 .46	50.5 1.8	4.82 .32	13.6 1.8	24.22 .85	57.1 1.5	14.64 .31	55.5 2.0
17.7	17.34 + .44	52.5 + 2.2	5.15 + .31	11.9 + 1.5	25.06 + .82	53.8 + 1.9	14.95 + .30	57.5 + 2.0
27.7	17.77 .41	54.9 2.5	5.45 .30	10.5 1.2	25.86 .76	61.0 2.4	15.25 .29	59.5 1.9
Aug. 6.7	18.16 .37	57.6 2.8	5.74 .27	9.5 0.9	26.58 .68	63.6 2.8	15.53 .27	61.3 1.8
16.6	18.51 .38	60.5 3.0	5.99 .24	8.8 0.5	27.22 .60	66.5 3.1	15.78 .24	63.0 1.6
26.6	18.81 .27	63.6 3.1	6.21 .20	8.5 + 0.2	27.77 .50	69.8 3.3	16.01 .21	64.5 1.4
Sept. 5.6	19.05 + .22	66.8 + 2.2	6.40 + .17	8.5 - 0.2	28.22 + .39	73.2 + 3.5	16.20 + .17	65.9 + 1.2
15.5	19.24 .16	70.1 3.2	6.55 .13	8.9 0.5	28.56 .28	76.8 3.6	16.36 .14	67.0 1.0
25.5	19.37 .10	73.3 3.2	6.66 .09	9.5 0.2	28.78 .16	80.5 3.7	16.48 .11	67.8 0.8
Oct. 5.5	19.44 + .05	76.5 3.1	6.73 .05	10.4 1.0	28.88 + .04	84.2 3.7	16.57 .07	68.5 0.5
15.5	19.46 - .01	79.6 2.9	6.76 + .02	11.5 1.2	28.87 - .07	87.9 3.6	16.63 .04	68.9 0.3
25.4	19.42 - .06	82.4 + 2.7	6.76 - .01	12.7 - 1.3	28.73 - .19	91.4 + 3.4	16.66 + .01	69.1 + 0.1
Nov. 4.4	19.34 .11	85.0 2.4	6.73 .04	14.0 1.3	28.49 .30	94.6 3.1	16.66 - .01	69.2 0.0
14.4	19.20 .15	87.2 2.0	6.68 .06	15.4 1.3	28.13 .40	97.6 2.8	16.63 .04	69.0 - 0.2
24.3	19.03 .19	89.1 1.6	6.60 .06	16.6 1.2	27.68 .50	100.1 2.3	16.58 .06	68.7 0.3
Dec. 4.3	18.81 .22	90.5 1.2	6.51 .10	17.8 1.1	27.14 .58	102.2 1.9	16.52 .06	68.4 0.4
14.3	18.57 - .26	91.5 + 0.7	6.40 - .11	18.8 - 0.9	26.52 - .65	101.8 + 1.3	16.43 - .09	67.9 - 0.5
24.3	18.30 .28	91.9 + 0.2	6.29 .12	19.6 0.7	25.84 .69	104.8 0.7	16.33 .10	67.3 0.6
34.2	18.02 - .25	91.9 - 0.3	6.17 - .11	20.2 - 0.5	25.13 - .72	105.3 + 0.1	16.23 - .11	66.7 - 0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ^1 Ceti.		38 Cassiopeiæ.		η Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 1 3	+35° 2'	h m 1 18	— 8° 44'	h m 1 22	+69° 41'	h m 1 25	+14° 46'
(Dec. 30.3)	33.55 —.16	17.5 —0.2	30.73 —.11	75.1 —0.8	62.42 —.40	64.9 +0.8	35.07 —.11	40.0 —0.5
Jan. 9.3	33.39 .16	17.1 0.6	30.61 .12	75.8 0.6	61.91 .52	65.4 +0.2	34.95 .12	39.4 0.6
19.2	33.22 .17	16.4 0.9	30.49 .12	76.3 0.4	61.37 .54	65.4 —0.4	34.82 .13	38.8 0.7
29.2	33.05 .16	15.4 1.1	30.37 .12	76.7 —0.2	60.83 .52	64.7 0.9	34.69 .13	38.1 0.7
Feb. 8.2	32.89 .15	14.1 1.3	30.25 .11	76.8 0.0	60.31 .50	63.5 1.4	34.56 .12	37.4 0.8
18.1	32.75 —.13	12.7 —1.5	30.14 —.10	76.8 +0.2	59.84 —.44	61.8 —1.2	34.44 —.11	36.6 —0.7
28.1	32.63 .10	11.1 1.6	30.04 .08	76.5 0.4	59.43 .37	59.7 2.3	34.34 .09	35.9 0.7
Mar. 10.1	32.55 .06	9.4 1.6	29.97 .05	76.0 0.6	59.10 .28	57.3 2.5	34.26 .06	35.2 0.6
20.1	32.51 —.02	7.8 1.5	29.93 —.02	75.2 0.9	58.87 .17	54.7 2.7	34.21 —.03	34.7 0.4
30.0	32.51 +.03	6.3 1.4	29.93 +.02	74.2 1.1	58.76 —.05	51.9 2.7	34.20 +.01	34.3 0.3
Apr. 9.0	32.57 +.06	5.0 —1.2	29.97 +.06	72.9 +1.4	58.77 +.07	49.2 —2.7	34.23 +.05	34.2 —0.1
19.0	32.68 .14	3.9 0.9	30.04 .10	71.4 1.6	58.90 .19	46.5 2.5	34.31 .10	34.2 +0.2
29.0	32.84 .19	2.2 0.6	30.16 .14	69.8 1.8	59.14 .30	44.1 2.2	34.43 .14	34.6 0.5
May 8.9	33.05 .23	2.7 —0.3	30.33 .18	67.9 2.0	59.51 .41	42.0 1.9	34.60 .19	35.2 0.7
18.9	33.31 .28	2.7 +0.1	30.53 .22	65.8 2.1	59.97 .51	40.3 1.5	34.81 .23	36.0 1.0
28.9	33.61 +.31	3.0 +0.5	30.77 +.25	63.7 +2.2	60.52 +.59	39.1 —1.0	35.05 +.24	37.2 +1.2
June 7.8	33.93 .34	3.7 0.9	31.04 .28	61.5 2.2	61.15 .65	38.3 —0.5	35.33 .29	38.5 1.5
17.8	34.28 .35	4.7 1.2	31.33 .30	59.3 2.2	61.81 .68	38.0 0.0	35.63 .31	40.1 1.7
27.8	34.64 .36	6.1 1.5	31.64 .31	57.1 2.1	62.52 .71	38.2 +0.5	35.94 .32	41.9 1.8
July 7.8	35.00 .36	7.8 1.8	31.95 .31	55.0 2.0	63.24 .72	39.0 1.0	36.26 .32	43.7 1.9
17.7	35.36 +.35	9.7 +2.1	32.27 +.31	53.1 +1.8	63.95 +.71	40.2 +1.5	36.59 +.32	45.7 +2.0
27.7	35.70 .33	11.9 2.2	32.57 .30	51.4 1.6	64.65 .68	41.9 1.9	36.90 .31	47.6 1.9
Aug. 6.7	36.02 .30	14.2 2.3	32.86 .28	49.9 1.3	65.31 .64	44.0 2.3	37.19 .29	49.6 1.9
16.6	36.32 .27	16.6 2.4	33.13 .26	48.8 1.0	65.92 .59	46.5 2.6	37.47 .26	51.4 1.8
26.6	36.58 .24	19.0 2.4	33.38 .23	47.9 0.7	66.48 .52	49.3 2.9	37.72 .23	53.2 1.7
Sept. 5.6	36.80 +.20	21.5 +2.4	33.59 +.20	47.3 +0.4	66.96 +.45	52.4 +3.2	37.94 +.20	54.8 +1.5
15.6	36.99 .17	23.9 2.4	33.77 .16	47.1 +0.1	67.37 .38	55.7 3.4	38.13 .17	56.2 1.3
25.5	37.13 .13	26.3 2.3	33.91 .13	47.1 —0.2	67.69 .28	59.1 3.5	38.28 .14	57.5 1.2
Oct. 5.5	37.24 .09	28.5 2.1	34.02 .09	47.5 0.4	67.93 .19	62.6 3.5	38.40 .11	58.5 1.0
15.5	37.31 .05	30.5 1.9	34.10 .06	48.0 0.7	68.08 .10	66.1 3.5	38.49 .07	59.4 0.8
25.5	37.34 +.02	32.4 +1.7	34.14 +.03	48.8 —0.8	68.13 +.01	69.5 +3.4	38.55 +.04	60.1 +0.6
Nov. 4.4	37.34 —.02	34.0 1.5	34.15 .00	49.7 0.9	68.10 —.08	72.8 3.2	38.58 +.01	60.5 0.4
14.4	37.31 .05	35.4 1.2	34.14 —.02	50.7 1.0	67.97 .17	75.9 2.9	38.58 —.01	60.8 +0.2
24.4	37.25 .06	36.5 0.9	34.10 .05	51.7 1.0	67.76 .25	78.6 2.6	38.55 .04	60.9 0.0
Dec. 4.3	37.15 .10	37.3 0.6	34.05 .07	52.8 1.0	67.46 .33	81.0 2.2	38.50 .06	60.9 —0.1
14.3	37.04 —.12	37.8 +0.3	33.97 —.09	53.8 —0.2	67.09 —.40	82.0 +1.7	38.43 —.08	60.7 —0.3
24.3	36.91 .14	37.9 0.0	33.87 .10	54.6 0.8	66.66 .46	84.4 1.2	38.34 .10	60.4 0.4
34.3	36.76 —.16	37.8 —0.2	33.77 —.11	55.4 —0.7	66.17 —.52	85.3 +0.6	38.23 —.11	59.0 —0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (Achernar.)		ϵ Piscium.		β Arietis.		50 Cassiopeiæ.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 1 33	—57° 47'	^h ^m 1 39	+ 8° 36'	^h ^m 1 48	+20° 16'	^h ^m 1 53	+71° 53'
(Dec. 30.3)	^s 36.50 —.31	68.7 —0.8	^s 34.42 —.10	8.4 —0.6	^s 33.16 —.11	11.2 —0.3	^s 62.78 —.58	30.4 +1.3
Jan. 9.3	36.19 .32	69.1 —0.1	34.31 .12	7.8 0.6	33.04 .13	10.8 0.4	62.23 .57	31.4 0.7
19.2	35.86 .32	69.0 +0.5	34.19 .13	7.2 0.6	32.90 .14	10.3 0.6	61.63 .61	31.8 +0.1
29.2	35.54 .31	68.2 1.0	34.06 .13	6.6 0.6	32.76 .14	9.6 0.7	61.02 .61	31.6 —0.5
Feb. 8.2	35.24 .29	67.0 1.5	33.93 .13	6.1 0.6	32.61 .14	8.9 0.8	60.41 .60	30.8 1.0
18.1	34.95 —.26	65.2 +2.0	33.80 —.12	5.5 —0.5	32.47 —.13	8.1 —0.8	59.82 —.55	29.5 —1.5
28.1	34.71 .32	62.9 2.4	33.70 .10	5.1 0.4	32.35 .11	7.2 0.8	59.30 .48	27.7 2.0
Mar. 10.1	34.50 .18	60.3 2.8	33.61 .07	4.8 0.3	32.25 .09	6.4 0.8	58.86 .39	25.6 2.5
20.1	34.35 .12	57.3 3.1	33.55 —.04	4.6 —0.1	32.18 .05	5.6 0.7	58.52 .28	23.1 2.6
30.0	34.26 —.06	54.1 3.4	33.53 .00	4.6 +0.1	32.14 —.01	5.0 0.6	58.30 .15	20.5 2.7
Apr. 9.0	34.23 .00	50.6 +3.5	33.55 +.04	4.8 +0.3	32.15 +.03	4.5 —0.4	58.21 —.02	17.7 —2.7
19.0	34.27 +.07	47.0 3.6	33.61 .08	5.2 0.6	32.21 .08	4.2 —0.2	58.26 +.12	15.0 2.6
29.0	34.38 .14	43.4 3.6	33.71 .13	5.9 0.8	32.31 .13	4.2 +0.1	58.44 .25	12.5 2.4
May 8.9	34.56 .21	39.7 3.6	33.86 .17	6.8 1.0	32.46 .17	4.4 0.4	58.76 .38	10.1 2.1
18.9	34.81 .26	36.2 3.4	34.06 .21	8.0 1.3	32.66 .21	4.9 0.6	59.19 .40	8.1 1.6
28.9	35.12 +.34	32.9 +3.2	34.29 +.25	9.4 +1.5	32.89 +.25	5.7 +0.9	59.74 +.50	6.5 —1.4
June 7.8	35.48 .39	29.8 2.9	34.55 .27	10.9 1.6	33.16 .28	6.7 1.1	60.37 .67	5.3 1.0
17.8	35.90 .43	27.0 2.6	34.84 .30	12.6 1.8	33.46 .31	8.0 1.4	61.08 .73	4.6 —0.5
27.8	36.35 .46	24.7 2.1	35.14 .31	14.5 1.9	33.77 .32	9.4 1.6	61.84 .77	4.3 0.0
July 7.8	36.83 .48	22.7 1.7	35.46 .32	16.4 1.9	34.10 .33	11.1 1.7	62.63 .80	4.6 +0.5
17.7	37.31 +.49	21.3 +1.2	35.77 +.31	18.3 +1.9	34.43 +.33	12.9 +1.8	63.43 +.80	5.4 +1.0
27.7	37.80 .48	20.5 +0.6	36.08 .30	20.2 1.8	34.75 .32	14.7 1.9	64.23 .79	6.7 1.5
Aug. 6.7	38.27 .46	20.2 0.0	36.38 .29	22.0 1.7	35.06 .30	16.6 1.9	65.00 .75	8.4 1.9
16.7	38.72 .43	20.5 —0.6	36.66 .27	23.7 1.6	35.36 .28	18.5 1.9	65.73 .71	10.5 2.3
26.6	39.13 .38	21.3 1.1	36.91 .24	25.2 1.4	35.63 .26	20.4 1.8	66.41 .65	12.9 2.6
Sept. 5.6	39.49 +.33	22.7 —1.6	37.14 +.21	26.5 +1.2	35.87 +.23	22.1 +1.7	67.02 +.58	15.7 +2.9
15.6	39.79 .27	24.5 2.1	37.34 .18	27.7 1.0	36.08 .20	23.8 1.6	67.56 .50	18.8 3.2
25.5	40.02 .20	26.8 2.4	37.50 .15	28.6 0.8	36.26 .16	25.2 1.4	68.02 .41	22.1 3.3
Oct. 5.5	40.19 .13	29.3 2.7	37.63 .12	29.3 0.6	36.41 .13	26.6 1.2	68.38 .32	25.5 3.4
15.5	40.29 +.06	32.1 2.8	37.74 .09	29.7 0.4	36.53 .10	27.7 1.1	68.65 .22	28.9 3.5
25.5	40.32 —.01	35.0 —2.9	37.81 +.06	30.0 +0.2	36.61 +.07	28.7 +0.9	68.82 +.11	32.4 +3.4
Nov. 4.4	40.28 .07	37.9 2.8	37.85 +.03	30.1 0.0	36.67 .04	29.4 0.7	68.86 +.01	35.8 3.3
14.4	40.17 .13	40.7 2.6	37.86 .00	30.0 —0.1	36.69 +.01	30.0 0.5	68.83 —.10	39.0 3.1
24.4	40.01 .19	43.2 2.3	37.85 —.02	29.8 0.3	36.69 —.02	30.5 0.3	68.69 .20	42.1 2.9
Dec. 4.4	39.80 .23	45.3 2.0	37.81 .05	29.5 0.4	36.65 .05	30.7 +0.2	68.43 .30	44.8 2.5
14.3	39.55 —.27	47.1 —1.5	37.75 —.07	29.0 —0.5	36.59 —.07	30.8 0.0	68.08 —.39	47.1 +2.1
24.3	39.26 .30	48.3 1.0	37.67 .09	29.6 0.5	36.51 .09	30.7 —0.2	67.64 .47	48.9 1.6
34.3	38.95 —.31	49.1 —0.5	37.57 —.11	28.0 —0.6	36.41 —.11	30.5 —0.3	67.14 —.54	50.3 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.								
Mean Solar Date.	α Arietis.		ξ^1 Ceti.		ϵ Cassiopeiæ.		ξ^2 Ceti.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 2 ^m 0	[°] +22 ['] 56	^h 2 ^m 7	[°] + 8 ['] 19	^h 2 ^m 19	[°] +66 ['] 54	^h 2 ^m 22	[°] + 7 ['] 57
(Dec.30.3)	^s 57.78	-.11	^s 30.9	-0.1	^s 9.66	-.09	^s 44.5	-0.6
Jan. 9.3	57.66	.13	30.7	0.3	9.56	.11	43.9	0.6
19.2	57.52	.14	30.3	0.5	9.44	.13	43.4	0.6
29.2	57.37	.15	29.7	0.7	9.30	.14	42.8	0.5
Feb. 8.2	57.22	.15	29.0	0.8	9.16	.14	42.3	0.5
18.2	57.07	-.14	28.1	-0.9	9.03	-.13	41.8	-0.4
28.2	56.94	.12	27.3	0.9	8.90	.12	41.5	0.3
Mar. 10.1	56.82	.10	26.4	0.9	8.79	.10	41.2	0.2
20.1	56.74	.07	25.5	0.8	8.71	.07	41.0	-0.1
30.1	56.69	-.03	24.7	0.7	8.66	-.03	41.1	+0.1
Apr. 9.1	56.69	+0.2	24.1	-0.5	8.66	+0.1	41.3	+0.3
19.0	56.73	.06	23.7	0.3	8.69	.06	41.7	0.5
29.0	56.82	.12	23.5	-0.1	8.77	.10	42.3	0.8
May 9.0	56.97	.16	23.5	+0.2	8.89	.15	43.2	1.0
18.9	57.15	.21	23.8	0.4	9.06	.19	44.3	1.2
28.9	57.38	+0.25	24.4	+0.7	9.27	+0.23	45.6	+1.4
June 7.9	57.65	.26	25.2	1.0	9.52	.26	47.1	1.6
17.9	57.94	.30	26.3	1.2	9.79	.28	48.8	1.7
27.8	58.26	.32	27.6	1.4	10.08	.30	50.6	1.8
July 7.8	58.59	.33	29.2	1.6	10.39	.31	52.4	1.8
17.8	58.92	+0.33	30.8	+1.7	10.70	+0.31	54.2	+1.8
27.7	59.25	.32	32.6	1.8	11.02	.31	56.1	1.8
Aug. 6.7	59.57	.31	34.5	1.9	11.32	.30	57.8	1.7
16.7	59.88	.29	36.3	1.9	11.61	.28	59.4	1.5
26.7	60.16	.27	38.2	1.8	11.88	.26	60.9	1.4
Sept. 5.6	60.42	+0.24	40.0	+1.7	12.12	+0.23	62.2	+1.9
15.6	60.64	.21	41.7	1.6	12.34	.20	63.2	1.0
25.6	60.84	.18	43.2	1.5	12.53	.17	64.1	0.7
Oct. 5.6	61.00	.15	44.7	1.4	12.69	.14	64.7	0.5
15.5	61.13	.12	45.9	1.2	12.82	.11	65.1	0.3
25.5	61.23	+0.09	47.0	+1.0	12.92	+0.08	65.3	+0.1
Nov. 4.5	61.30	.06	48.0	0.8	12.99	.05	65.3	-0.1
14.4	61.34	+0.03	48.8	0.6	13.03	+0.03	65.2	0.2
24.4	61.35	-.01	49.4	0.5	13.04	.00	65.0	0.3
Dec. 4.4	61.33	.04	49.8	0.3	13.03	-.03	64.6	0.4
14.4	61.28	-.07	50.0	+0.1	12.99	-.05	64.2	-0.5
24.3	61.20	.09	50.0	-0.1	12.92	.08	63.7	0.5
34.3	61.10	-.12	49.9	-0.3	12.83	-.11	63.2	-0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.								
Mean Solar Date.	α Arietis.		ξ^1 Ceti.		ϵ Cassiopeiæ.		ξ^2 Ceti.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 2 ^m 0	[°] +22 ['] 56	^h 2 ^m 7	[°] + 8 ['] 19	^h 2 ^m 19	[°] +66 ['] 54	^h 2 ^m 22	[°] + 7 ['] 57
(Dec.30.3)	^s 57.78	-.11	^s 30.9	-0.1	^s 9.66	-.09	^s 44.5	-0.6
Jan. 9.3	57.66	.13	30.7	0.3	9.56	.11	43.9	0.6
19.2	57.52	.14	30.3	0.5	9.44	.13	43.4	0.6
29.2	57.37	.15	29.7	0.7	9.30	.14	42.8	0.5
Feb. 8.2	57.22	.15	29.0	0.8	9.16	.14	42.3	0.5
18.2	57.07	-.14	28.1	-0.9	9.03	-.13	41.8	-0.4
28.2	56.94	.12	27.3	0.9	8.90	.12	41.5	0.3
Mar. 10.1	56.82	.10	26.4	0.9	8.79	.10	41.2	0.2
20.1	56.74	.07	25.5	0.8	8.71	.07	41.0	-0.1
30.1	56.69	-.03	24.7	0.7	8.66	-.03	41.1	+0.1
Apr. 9.1	56.69	+0.2	24.1	-0.5	8.66	+0.1	41.3	+0.3
19.0	56.73	.06	23.7	0.3	8.69	.06	41.7	0.5
29.0	56.82	.12	23.5	-0.1	8.77	.10	42.3	0.8
May 9.0	56.97	.16	23.5	+0.2	8.89	.15	43.2	1.0
18.9	57.15	.21	23.8	0.4	9.06	.19	44.3	1.2
28.9	57.38	+0.25	24.4	+0.7	9.27	+0.23	45.6	+1.4
June 7.9	57.65	.26	25.2	1.0	9.52	.26	47.1	1.6
17.9	57.94	.30	26.3	1.2	9.79	.28	48.8	1.7
27.8	58.26	.32	27.6	1.4	10.08	.30	50.6	1.8
July 7.8	58.59	.33	29.2	1.6	10.39	.31	52.4	1.8
17.8	58.92	+0.33	30.8	+1.7	10.70	+0.31	54.2	+1.8
27.7	59.25	.32	32.6	1.8	11.02	.31	56.1	1.8
Aug. 6.7	59.57	.31	34.5	1.9	11.32	.30	57.8	1.7
16.7	59.88	.29	36.3	1.9	11.61	.28	59.4	1.5
26.7	60.16	.27	38.2	1.8	11.88	.26	60.9	1.4
Sept. 5.6	60.42	+0.24	40.0	+1.7	12.12	+0.23	62.2	+1.9
15.6	60.64	.21	41.7	1.6	12.34	.20	63.2	1.0
25.6	60.84	.18	43.2	1.5	12.53	.17	64.1	0.7
Oct. 5.6	61.00	.15	44.7	1.4	12.69	.14	64.7	0.5
15.5	61.13	.12	45.9	1.2	12.82	.11	65.1	0.3
25.5	61.23	+0.09	47.0	+1.0	12.92	+0.08	65.3	+0.1
Nov. 4.5	61.30	.06	48.0	0.8	12.99	.05	65.3	-0.1
14.4	61.34	+0.03	48.8	0.6	13.03	+0.03	65.2	0.2
24.4	61.35	-.01	49.4	0.5	13.04	.00	65.0	0.3
Dec. 4.4	61.33	.04	49.8	0.3	13.03	-.03	64.6	0.4
14.4	61.28	-.07	50.0	+0.1	12.99	-.05	64.2	-0.5
24.3	61.20	.09	50.0	-0.1	12.92	.08	63.7	0.5
34.3	61.10	-.12	49.9	-0.3	12.83	-.11	63.2	-0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 2 ^m 37	+ [°] 2 ['] 46	^h 2 ^m 56	+ [°] 3 ['] 39	^h 3 ^m 6	+ [°] 77 ['] 19	^h 3 ^m 8	+ [°] 20 ['] 38
(Dec. 30.3	^s 35.67 - .08	12.3 - 0.7	^s 31.48 - .07	22.1 - 0.7	^s 24.19 - .57	56.2 + 2.2	^s 34.47 - .07	9.8 0.0
Jan. 9.3	35.58 .11	11.6 0.6	31.39 .10	21.5 0.6	23.54 .71	58.1 1.7	34.39 .10	9.7 - 0.1
19.3	35.46 .13	11.0 0.6	31.28 .12	20.9 0.6	22.78 .81	59.6 1.2	34.27 .13	9.5 0.2
29.3	35.33 .14	10.5 0.5	31.15 .14	20.4 0.5	21.93 .87	60.5 + 0.6	34.13 .15	9.2 0.3
Feb. 8.2	35.19 .14	10.1 0.4	31.00 .15	19.9 0.4	21.03 .91	60.8 0.0	33.98 .16	8.9 0.4
18.2	35.04 - .14	9.8 - 0.3	30.85 - .15	19.6 - 0.3	20.11 - .90	60.5 - 0.6	33.83 - .16	8.4 - 0.5
28.2	34.90 .13	9.6 - 0.1	30.70 .14	19.4 - 0.1	19.22 .85	59.6 1.1	33.65 .16	7.9 0.5
Mar. 10.2	34.77 .12	9.5 0.0	30.57 .13	19.3 0.0	18.41 .77	58.3 1.6	33.50 .14	7.3 0.5
20.1	34.67 .09	9.7 + 0.2	30.45 .10	19.4 + 0.2	17.68 .66	56.4 2.0	33.36 .12	6.8 0.5
30.1	34.59 .06	10.0 0.4	30.36 .07	19.7 0.4	17.10 .50	54.2 2.4	33.26 .09	6.3 0.5
Apr. 9.1	34.56 - .02	10.5 + 0.6	30.30 - .03	20.1 + 0.6	16.68 - .33	51.7 - 2.6	33.19 - .05	5.9 - 0.4
19.0	34.56 + .02	11.2 0.6	30.29 + .01	20.8 0.6	16.44 - .15	49.0 2.7	33.17 .00	5.6 0.2
29.0	34.61 .07	12.1 1.0	30.32 .05	21.6 1.0	16.37 + .03	46.2 2.7	33.19 + .05	5.4 - 0.1
May 9.0	34.70 .12	13.3 1.2	30.39 .10	22.7 1.2	16.51 .23	43.5 2.6	33.26 .10	5.4 + 0.1
19.0	34.84 .16	14.6 1.4	30.51 .14	23.9 1.4	16.83 .41	41.0 2.4	33.38 .14	5.7 0.3
28.9	35.02 + .20	16.1 + 1.6	30.68 + .16	25.4 + 1.5	17.33 + .58	38.6 - 2.2	33.55 + .19	6.1 + 0.5
June 7.9	35.23 .22	17.8 1.7	30.88 .22	27.0 1.6	17.99 .73	36.6 1.9	33.76 .22	6.8 0.8
17.9	35.48 .26	19.6 1.8	31.12 .25	28.7 1.7	18.79 .86	34.9 1.5	34.01 .26	7.6 1.0
27.8	35.76 .28	21.5 1.9	31.39 .28	30.5 1.8	19.71 .97	33.6 1.0	34.29 .29	8.6 1.1
July 7.8	36.05 .30	23.4 1.9	31.67 .29	32.3 1.8	20.72 1.05	32.8 0.6	34.59 .30	9.9 1.3
17.8	36.36 + .31	25.2 + 1.8	31.97 + .30	34.1 + 1.8	21.80 + 1.10	32.5 - 0.1	34.90 + .31	11.2 + 1.4
27.8	36.67 .30	27.0 1.7	32.28 .31	35.8 1.7	22.93 1.13	32.6 + 0.4	35.23 .32	12.6 1.4
Aug. 6.7	36.97 .30	28.7 1.8	32.59 .30	37.5 1.8	24.07 1.14	33.2 0.8	35.55 .32	14.0 1.5
16.7	37.27 .29	30.1 1.4	32.88 .29	38.9 1.4	25.21 1.12	34.2 1.3	35.87 .31	15.5 1.5
26.7	37.55 .27	31.4 1.2	33.17 .28	40.2 1.2	26.32 1.09	35.7 1.7	36.18 .30	17.0 1.4
Sept. 5.7	37.81 + .25	32.4 + 0.9	33.44 + .26	41.2 + 0.9	27.39 + 1.03	37.6 + 2.1	36.47 + .26	18.3 + 1.3
15.6	38.05 .23	33.2 0.7	33.69 .24	42.0 0.7	28.38 .95	39.9 2.4	36.75 .26	19.6 1.2
25.6	38.26 .20	33.7 0.4	33.92 .21	42.6 0.4	29.29 .86	42.5 2.7	37.00 .24	20.8 1.1
Oct. 5.6	38.44 .17	34.0 + 0.2	34.12 .19	42.8 + 0.2	30.11 .75	45.4 3.0	37.23 .21	21.9 1.0
15.5	38.60 .14	34.1 - 0.1	34.30 .16	42.9 0.0	30.80 .63	48.5 2.2	37.42 .19	22.8 0.9
25.5	38.73 + .11	33.9 - 0.3	34.44 + .13	42.7 - 0.2	31.30 + .49	51.8 + 3.3	37.60 + .16	23.6 + 0.7
Nov. 4.5	38.82 .08	33.5 0.4	34.56 .10	42.4 0.4	31.78 .34	55.2 3.4	37.74 .13	24.2 0.6
14.5	38.89 .05	33.0 0.5	34.65 .07	41.9 0.5	32.05 .18	58.6 3.4	37.85 .09	24.8 0.5
24.4	38.93 + .08	32.4 0.6	34.70 .04	41.3 0.6	32.14 + .01	62.0 3.3	37.93 .06	25.2 0.4
Dec. 4.4	38.94 - .01	31.7 0.7	34.73 + .01	40.6 0.7	32.07 - .16	65.2 3.1	37.97 + .03	25.5 0.3
14.4	38.92 - .04	31.0 - 0.7	34.72 - .02	39.9 - 0.7	31.83 - .22	68.2 + 2.8	37.98 - .01	25.7 + 0.2
24.4	38.87 .00	30.3 0.7	34.69 .05	39.2 0.7	31.43 .48	70.9 2.5	37.95 .04	25.8 + 0.1
34.3	38.79 - .09	29.6 - 0.6	34.62 - .08	38.6 - 0.6	30.88 - .02	73.2 + 2.1	37.89 - .08	25.8 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ϵ Eridani.		δ Persei.		γ Tauri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 3 ^m 16	+49° 28'	^h 3 ^m 27	— 9° 49'	^h 3 ^m 35	+47° 25'	^h 3 ^m 40	+23° 45'
(Dec. 30.4)	28.23 —.12	14.2 +1.2	44.83 —.07	59.7 —1.2	5.68 —.08	71.2 +1.3	56.61 —.08	51.5 +0.2
Jan. 9.3	28.08 .17	15.3 0.9	44.74 .10	60.8 1.0	5.56 .14	72.3 1.0	56.54 .08	51.7 +0.1
19.3	27.89 .21	16.1 0.5	44.63 .12	61.7 0.8	5.40 .18	73.2 0.7	56.44 .12	51.7 0.0
29.3	27.67 .24	16.4 +0.2	44.50 .14	62.5 0.6	5.20 .22	73.7 +0.3	56.31 .14	51.6 —0.1
Feb. 8.2	27.42 .28	16.4 —0.2	44.35 .16	62.9 0.3	4.96 .24	73.8 0.0	56.15 .16	51.4 0.2
18.2	27.16 —.26	16.0 —0.6	44.18 —.16	63.2 —0.1	4.71 —.26	73.6 —0.4	55.98 —.17	51.1 —0.3
28.2	26.89 .25	15.3 0.9	44.02 .16	63.2 +0.1	4.46 .25	73.1 0.7	55.80 .18	50.7 0.4
Mar. 10.2	26.65 .23	14.2 1.2	43.86 .15	62.9 0.4	4.22 .23	72.2 1.0	55.63 .17	50.3 0.5
20.1	26.43 .20	12.8 1.4	43.71 .13	62.3 0.7	4.00 .20	71.1 1.2	55.47 .14	49.7 0.5
30.1	26.25 .15	11.3 1.6	43.59 .11	61.5 0.9	3.81 .16	69.7 1.4	55.34 .11	49.2 0.5
Apr. 9.1	26.13 —.09	9.7 —1.7	43.50 —.07	60.4 +1.2	3.68 —.11	68.2 —1.5	55.25 —.07	48.7 —0.5
19.1	26.07 —.03	7.9 1.7	43.45 —.03	59.1 1.4	3.60 —.05	66.7 1.6	55.19 —.03	48.3 0.4
29.0	26.08 +.04	6.2 1.6	43.44 +.01	57.6 1.6	3.58 +.02	65.1 1.5	55.18 +.02	47.9 0.3
May 9.0	26.16 .11	4.6 1.5	43.47 .06	55.8 1.8	3.64 .08	63.6 1.4	55.23 .07	47.7 —0.1
19.0	26.30 .18	3.2 1.3	43.55 .10	53.9 2.0	3.75 .15	62.2 1.3	55.32 .12	47.7 +0.1
28.9	26.51 +.24	2.0 —1.1	43.68 +.15	51.8 +2.1	3.93 +.21	61.0 —1.1	55.46 +.16	47.9 +0.2
June 7.9	26.78 .20	1.1 0.8	43.85 .19	49.6 2.2	4.18 .27	60.1 0.8	55.65 .20	48.2 0.4
17.9	27.10 .24	0.5 0.5	44.06 .22	47.4 2.2	4.47 .22	59.4 0.5	55.87 .24	48.8 0.6
27.9	27.47 .28	0.1 —0.1	44.29 .25	45.1 2.2	4.81 .26	59.1 —0.2	56.13 .28	49.5 0.8
July 7.8	27.86 .41	0.2 +0.2	44.56 .27	42.9 2.1	5.18 .29	59.0 +0.1	56.42 .30	50.4 1.0
17.8	28.28 +.43	0.5 +0.5	44.84 +.29	40.8 +2.0	5.58 +.41	59.2 +0.4	56.73 +.22	51.4 +1.1
27.8	28.72 .44	1.2 0.8	45.13 .30	39.0 1.8	5.99 .22	59.7 0.6	57.05 .23	52.5 1.2
Aug. 6.8	29.16 .44	2.1 1.1	45.43 .30	37.3 1.6	6.42 .23	60.5 0.9	57.38 .23	53.7 1.2
16.7	29.60 .42	3.4 1.4	45.73 .29	35.9 1.2	6.84 .22	61.5 1.2	57.71 .23	55.0 1.2
26.7	30.02 .41	4.9 1.6	46.02 .28	34.8 0.9	7.26 .41	62.8 1.4	58.03 .22	56.2 1.2
Sept. 5.7	30.43 +.29	6.6 +1.8	46.30 +.27	34.1 +0.5	7.67 +.29	64.3 +1.6	58.35 +.21	57.4 +1.2
15.6	30.81 .27	8.4 2.0	46.57 .25	33.7 +0.2	8.05 .27	65.9 1.7	58.64 .29	58.6 1.1
25.6	31.16 .24	10.5 2.1	46.81 .23	33.7 —0.2	8.41 .25	67.7 1.8	58.92 .27	59.7 1.1
Oct. 5.6	31.49 .20	12.6 2.2	47.03 .21	34.1 0.5	8.74 .22	69.6 1.9	59.18 .25	60.7 1.0
15.6	31.77 .26	14.8 2.2	47.23 .18	34.7 0.8	9.04 .20	71.6 2.0	59.42 .22	61.6 0.9
25.5	32.01 +.22	17.1 +2.2	47.40 +.15	35.7 —1.1	9.30 +.24	73.6 +2.0	59.62 +.19	62.5 +0.8
Nov. 4.5	32.22 .18	19.3 2.2	47.54 .12	36.8 1.2	9.53 .20	75.7 2.0	59.80 .17	63.2 0.7
14.5	32.37 .13	21.5 2.2	47.65 .09	38.2 1.4	9.71 .15	77.7 2.0	59.95 .13	63.8 0.6
24.5	32.47 .08	23.6 2.1	47.72 .06	39.6 1.5	9.84 .10	79.7 1.9	60.07 .10	64.4 0.5
Dec. 4.4	32.52 +.02	25.6 1.9	47.77 +.03	41.1 1.5	9.92 +.05	81.6 1.8	60.15 .06	64.8 0.4
14.4	32.52 —.03	27.4 +1.7	47.78 —.01	42.5 —1.4	9.94 .00	83.3 +1.6	60.19 +.02	65.2 +0.3
24.4	32.46 .08	29.0 1.4	47.75 .04	43.9 1.2	9.92 —.06	84.8 1.4	60.19 —.02	65.5 0.2
34.4	32.35 —.13	30.3 +1.1	47.69 —.06	45.1 —1.1	9.84 —.11	86.2 +1.2	60.15 —.08	65.7 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ϵ Tauri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 3 47	+31° 33'	^h ^m 3 52	-13° 49'	^h ^m 4 13	+15° 21'	^h ^m 4 22	+18° 56'
(Dec.30.4)	^s 13.00 -05	23.9 +0.6	^s 53.99 -05	27.7 -1.4	^s 32.02 -01	39.1 -0.2	^s 11.62 -01	7.6 0.0
Jan. 9.3	12.93 .09	24.4 0.4	53.92 .09	29.1 1.2	31.99 .05	38.9 0.2	11.60 .05	7.6 0.0
19.3	12.82 .19	24.7 0.2	53.82 .19	30.2 1.0	31.91 .09	38.7 0.2	11.52 .09	7.5 -0.1
29.3	12.68 .16	24.9 +0.1	53.68 .14	31.1 0.7	31.80 .12	38.5 0.2	11.42 .12	7.4 0.1
Feb. 8.3	12.51 .18	24.8 -0.1	53.53 .16	31.7 0.5	31.66 .15	38.2 0.2	11.28 .15	7.3 0.1
18.2	12.32 -0.19	24.6 -0.2	53.36 -0.17	32.0 -0.2	31.50 -0.16	38.0 -0.2	11.12 -0.17	7.1 -0.2
28.2	12.13 .19	24.2 0.5	53.19 .17	32.0 +0.1	31.33 .17	37.8 0.2	10.95 .18	6.9 0.2
Mar. 10.2	11.94 .18	23.6 0.6	53.01 .17	31.8 0.4	31.16 .17	37.6 0.2	10.77 .17	6.7 0.2
20.2	11.76 .16	23.0 0.7	52.85 .16	31.2 0.7	31.00 .15	37.4 0.2	10.60 .16	6.4 0.2
30.1	11.62 .13	22.2 0.8	52.71 .13	30.3 1.0	30.86 .13	37.2 -0.1	10.45 .14	6.2 0.2
Apr. 9.1	11.51 -0.09	21.4 -0.8	52.60 -0.09	29.2 +1.3	30.74 -0.10	37.2 0.0	10.33 -0.10	6.0 -0.2
19.1	11.44 -0.04	20.6 0.8	52.53 .05	27.8 1.5	30.66 .06	37.2 +0.1	10.24 .06	5.9 -0.1
29.1	11.43 +0.01	19.8 0.7	52.49 -0.01	26.1 1.8	30.63 -0.01	37.3 0.2	10.20 -0.09	5.8 0.0
May 9.0	11.46 .06	19.2 0.6	52.50 +0.03	24.2 2.0	30.64 +0.03	37.5 0.3	10.20 +0.03	5.9 +0.1
19.0	11.55 .12	18.7 0.4	52.56 .08	22.1 2.2	30.69 .08	38.0 0.5	10.25 .07	6.1 0.2
29.0	11.70 +0.17	18.4 -0.2	52.66 +0.12	19.9 +2.3	30.79 +0.12	38.5 +0.6	10.35 +0.12	6.4 +0.4
June 7.9	11.89 .21	18.2 0.0	52.80 .16	17.6 2.4	30.94 .17	39.2 0.8	10.49 .16	6.9 0.5
17.9	12.12 .25	18.3 +0.2	52.99 .20	15.2 2.4	31.13 .21	40.1 0.9	10.67 .20	7.5 0.7
27.9	12.39 .29	18.6 0.4	53.21 .23	12.8 2.3	31.35 .24	41.1 1.0	10.89 .24	8.2 0.8
July 7.9	12.70 .31	19.1 0.6	53.46 .28	10.5 2.2	31.61 .27	42.2 1.1	11.15 .27	9.1 0.9
17.8	13.02 +0.33	19.8 +0.8	53.73 +0.28	8.3 +2.1	31.88 +0.29	43.3 +1.2	11.42 +0.29	10.1 +1.0
27.8	13.36 .34	20.6 0.9	54.02 .29	6.3 1.9	32.18 .30	44.5 1.2	11.72 .30	11.1 1.0
Aug. 6.8	13.71 .35	21.6 1.1	54.31 .30	4.6 1.6	32.49 .31	45.7 1.2	12.03 .31	12.1 1.0
16.8	14.06 .35	22.7 1.2	54.61 .30	3.2 1.3	32.80 .31	46.8 1.1	12.35 .32	13.2 1.0
26.7	14.41 .34	24.0 1.2	54.91 .29	2.1 0.9	33.11 .31	47.9 1.0	12.66 .31	14.2 1.0
Sept. 5.7	14.74 +0.33	25.2 +1.3	55.20 +0.28	1.4 +0.5	33.41 +0.30	48.9 +0.9	12.97 +0.31	15.1 +0.9
15.7	15.06 .31	26.5 1.3	55.48 .27	1.1 +0.1	33.71 .29	49.7 0.8	13.28 .30	15.9 0.8
25.6	15.36 .29	27.7 1.3	55.74 .25	1.2 -0.3	33.99 .27	50.4 0.6	13.57 .29	16.6 0.7
Oct. 5.6	15.65 .27	29.0 1.2	55.99 .23	1.7 0.7	34.26 .28	50.9 0.5	13.85 .27	17.2 0.5
15.6	15.90 .24	30.2 1.2	56.20 .20	2.5 1.0	34.51 .24	51.3 0.3	14.11 .25	17.7 0.4
25.6	16.13 +0.21	31.4 +1.2	56.40 +0.18	3.7 -1.3	34.73 +0.21	51.5 +0.2	14.35 +0.23	18.1 +0.3
Nov. 4.5	16.33 .18	32.6 1.1	56.56 .15	5.1 1.5	34.94 .19	51.6 +0.1	14.56 .20	18.4 0.2
14.5	16.50 .15	33.7 1.1	56.69 .12	6.7 1.7	35.11 .16	51.7 0.0	14.75 .17	18.6 0.1
24.5	16.63 .11	34.7 1.0	56.79 .08	8.4 1.7	35.25 .13	51.6 -0.1	14.90 .14	18.7 0.1
Dec. 4.5	16.72 .07	35.6 0.9	56.86 .05	10.2 1.7	35.36 .09	51.4 0.2	15.03 .10	18.7 +0.1
14.4	16.77 +0.03	36.5 +0.8	56.89 +0.01	11.9 -1.7	35.43 +0.05	51.3 -0.2	15.11 +0.06	18.8 0.0
24.4	16.77 -0.02	37.2 0.7	56.88 -0.02	13.5 1.6	35.46 +0.01	51.1 0.2	15.15 +0.02	18.8 0.0
34.4	16.73 -0.06	37.8 +0.5	56.84 -0.06	15.0 -1.4	35.46 -0.03	50.9 -0.2	15.15 -0.02	18.8 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (Aldebaran.)		α Camelopardalis.		ϵ Aurigæ.		β Orionis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 4 ^m 29	+16° 17'	^h 4 ^m 43	+66° 9'	^h 4 ^m 49	+32° 59'	^h 4 ^m 58	+15° 14'
(Dec.30.4)	^s 36.58 .00	13.3 -0.3	^s 7.84 -0.6	21.9 +2.5	^s 49.97 +0.3	29.2 +0.3	^s 17.12 +0.2	58.9 -0.2
Jan. 9.4	36.55 -.04	13.2 0.2	7.72 .16	24.2 2.2	49.96 -.03	29.9 0.7	17.12 -.02	58.7 0.2
19.4	36.49 .06	13.0 0.2	7.51 .96	26.3 1.9	49.90 .06	30.6 0.6	17.08 .06	58.5 0.2
29.3	36.39 .12	12.8 0.2	7.21 .34	28.0 1.5	49.79 .13	31.1 0.5	16.99 .10	58.3 0.2
Feb. 8.3	36.25 .14	12.6 0.2	6.83 .40	29.2 1.0	49.65 .16	31.5 0.3	16.87 .13	58.2 0.1
18.3	36.10 -.16	12.5 -0.2	6.40 -.44	30.1 +0.6	49.47 -.19	31.7 +0.1	16.72 -.16	58.1 -0.1
28.2	35.93 .17	12.3 0.2	5.94 .47	30.4 +0.1	49.28 .90	31.7 -0.1	16.56 .17	58.0 0.1
Mar. 10.2	35.75 .17	12.1 0.2	5.47 .46	30.2 -0.4	49.07 .90	31.6 0.2	16.38 .18	57.9 0.1
20.2	35.58 .16	11.9 0.2	5.01 .44	29.6 0.9	48.87 .19	31.3 0.4	16.20 .17	57.8 -0.1
30.2	35.43 .14	11.8 -0.1	4.59 .39	28.5 1.3	48.68 .17	30.8 0.5	16.04 .15	57.7 0.0
Apr. 9.1	35.30 -.11	11.7 0.0	4.23 -.32	27.0 -1.6	48.53 -.14	30.2 -0.6	15.90 -.13	57.7 0.0
19.1	35.21 .07	11.7 0.0	3.95 .94	25.3 1.9	48.41 .10	29.6 0.7	15.79 .09	57.8 +0.1
29.1	35.16 -.03	11.7 +0.1	3.75 .14	23.2 2.1	48.33 -.05	28.9 0.7	15.72 .05	57.9 0.2
May 9.1	35.16 +0.2	11.9 0.2	3.65 -.09	21.1 2.2	48.30 .00	28.2 0.7	15.69 -.01	58.2 0.3
19.0	35.20 .06	12.2 0.4	3.66 +0.6	18.8 2.2	48.33 +0.5	27.6 0.6	15.70 +0.4	58.5 0.4
29.0	35.29 +1.1	12.7 +0.5	3.76 +1.6	16.6 -2.2	48.41 +1.0	27.0 -0.5	15.76 +0.6	59.0 +0.5
June 8.0	35.42 .15	13.3 0.7	3.97 .96	14.5 2.1	48.54 .15	26.6 0.4	15.87 .13	59.6 0.6
17.9	35.59 .19	14.1 0.8	4.28 .35	12.5 1.9	48.71 .90	26.3 0.2	16.02 .17	60.3 0.7
27.9	35.81 .23	14.9 0.9	4.67 .43	10.7 1.7	48.93 .94	26.1 -0.1	16.20 .90	61.1 0.8
July 7.9	36.05 .96	15.9 1.0	5.14 .50	9.2 1.4	49.19 .97	26.1 +0.1	16.42 .23	62.0 0.9
17.9	36.32 +.96	16.9 +1.0	5.68 +.56	7.9 -1.1	49.48 +.30	26.3 +0.2	16.67 +.26	62.9 +0.9
27.8	36.61 .30	18.0 1.1	6.27 .61	7.1 0.7	49.80 .32	26.6 0.3	16.94 .28	63.9 1.0
Aug. 6.8	36.91 .31	19.0 1.1	6.90 .64	6.5 -0.4	50.13 .34	27.0 0.5	17.23 .29	64.8 0.9
16.8	37.22 .31	20.1 1.0	7.55 .66	6.3 0.0	50.47 .35	27.5 0.6	17.53 .30	65.7 0.9
26.8	37.53 .31	21.1 0.9	8.23 .68	6.5 +0.4	50.82 .35	28.1 0.6	17.83 .31	66.6 0.8
Sept. 5.7	37.84 +.31	21.9 +0.8	8.91 +.67	7.0 +0.7	51.17 +.35	28.8 +0.7	18.14 +.31	67.3 +0.7
15.7	38.14 .30	22.7 0.7	9.58 .66	7.9 1.0	51.52 .34	29.5 0.7	18.45 .30	67.9 0.5
25.7	38.43 .98	23.3 0.5	10.24 .64	9.1 1.4	51.86 .33	30.3 0.8	18.75 .29	68.3 0.4
Oct. 5.6	38.71 .97	23.8 0.4	10.87 .61	10.6 1.7	52.19 .29	31.1 0.8	19.04 .98	68.6 0.2
15.6	38.97 .25	24.1 0.3	11.46 .57	12.4 1.9	52.50 .30	31.9 0.8	19.31 .27	68.8 +0.1
25.6	39.21 +.23	24.3 +0.1	12.01 +.52	14.5 +2.2	52.80 +.28	32.7 +0.8	19.57 +.25	68.8 -0.1
Nov. 4.6	39.43 .21	24.4 0.0	12.50 .46	16.7 2.4	53.07 .25	33.5 0.8	19.81 .23	68.7 0.2
14.5	39.62 .18	24.4 0.0	12.92 .38	19.2 2.6	53.30 .22	34.3 0.8	20.03 .20	68.5 0.2
24.5	39.78 .14	24.3 -0.1	13.26 .30	21.9 2.7	53.51 .18	35.2 0.9	20.22 .17	68.3 0.3
Dec. 4.5	39.91 .11	24.2 0.2	13.52 .21	24.6 2.7	53.68 .14	36.1 0.8	20.37 .14	68.0 0.3
14.5	39.99 +0.6	24.1 -0.2	13.67 +.11	27.3 +2.7	53.80 +.10	36.9 +0.8	20.49 +.10	67.7 -0.3
24.4	40.04 +0.3	23.9 0.2	13.73 .00	29.9 2.6	53.87 +0.5	37.7 0.8	20.56 +0.5	67.5 0.3
34.4	40.05 -.02	23.7 -0.2	13.69 -.10	32.4 +2.4	53.90 .00	38.5 +0.7	20.59 .00	67.2 -0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ϵ Orionis.		α Columbae.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h ^m 5 26	— 0° 22'	^h ^m 5 27	— 17° 53'	^h ^m 5 30	— 1° 16'	^h ^m 5 35	— 34° 7'
(Dec. 30.4)	^s 23.48 +.04	55.6 —1.9	^s 53.19 +.02	70.5 —2.1	^s 38.18 +.04	25.2 —1.3	^s 40.86 +.01	65.3 —2.8
Jan. 9.4	23.49 —.01	56.7 1.1	53.19 —.02	72.5 1.9	38.20 .00	26.4 1.1	40.84 —.05	68.0 2.5
19.4	23.47 .05	57.7 0.9	53.15 .07	74.3 1.6	38.17 —.05	27.4 1.0	40.77 .10	70.3 2.2
29.4	23.40 .09	58.5 0.7	53.06 .11	75.8 1.3	38.10 .09	28.3 0.8	40.65 .14	72.4 1.8
Feb. 8.3	23.29 .12	59.2 0.6	52.93 .14	77.0 1.0	38.00 .12	29.0 0.6	40.46 .18	74.0 1.4
18.3	23.15 —.15	59.7 —0.4	52.78 —.17	77.9 —0.7	37.86 —.15	29.6 —0.4	40.28 —.21	75.2 —1.0
28.3	22.99 .17	60.0 —0.2	52.60 .19	78.4 —0.4	37.70 .17	29.9 —0.2	40.06 .23	76.0 0.6
Mar. 10.3	22.82 .17	60.1 0.0	52.40 .19	78.6 0.0	37.53 .19	30.0 0.0	39.82 .24	76.3 —0.1
20.2	22.64 .17	60.0 +0.2	52.21 .19	78.5 +0.3	37.35 .17	30.0 +0.1	39.58 .24	76.2 +0.3
30.2	22.47 .16	59.8 0.3	52.02 .18	78.0 0.6	37.18 .16	29.7 0.3	39.34 .23	75.6 0.8
Apr. 9.2	22.32 —.14	59.4 +0.5	51.84 —.16	77.2 +0.9	37.03 —.14	29.3 +0.5	39.12 —.21	74.7 +1.2
19.2	22.19 .11	58.8 0.7	51.69 .13	76.2 1.2	36.90 .11	28.7 0.7	38.93 .18	73.2 1.6
29.1	22.10 .08	58.0 0.9	51.58 .10	74.8 1.5	36.80 .08	27.9 0.9	38.77 .14	71.5 2.0
May 9.1	22.04 —.04	57.0 1.0	51.50 .06	73.1 1.8	36.74 —.04	26.9 1.1	38.65 .10	69.3 2.3
19.1	22.02 .00	55.9 1.2	51.46 —.01	71.2 2.0	36.71 .00	25.7 1.2	38.57 —.05	66.9 2.5
29.0	22.05 +.05	54.7 +1.3	51.47 +.03	69.1 +2.2	36.74 +.04	24.4 +1.4	38.55 .00	64.2 +2.8
June 8.0	22.12 .09	53.3 1.4	51.52 .07	66.8 2.3	36.80 .08	23.0 1.5	38.57 +.04	61.4 2.9
18.0	22.22 .13	51.8 1.5	51.61 .11	64.5 2.4	36.90 .12	21.5 1.6	38.63 .09	58.4 3.0
28.0	22.37 .16	50.2 1.6	51.75 .15	62.0 2.4	37.05 .16	19.8 1.6	38.75 .14	55.4 3.0
July 7.9	22.55 .29	48.6 1.6	51.92 .19	59.6 2.4	37.22 .19	18.2 1.6	38.90 .18	52.4 2.9
17.9	22.77 +.23	47.0 +1.5	52.12 +.22	57.3 +2.3	37.43 +.22	16.6 +1.6	39.10 +.21	49.6 +2.8
27.9	23.00 .25	45.5 1.4	52.35 .24	55.1 2.1	37.67 .24	15.1 1.5	39.33 .24	46.9 2.5
Aug. 6.8	23.26 .26	44.1 1.3	52.60 .26	53.2 1.8	37.92 .26	13.7 1.3	39.59 .27	44.5 2.2
16.8	23.53 .26	42.9 1.1	52.87 .26	51.5 1.5	38.19 .27	12.4 1.1	39.88 .29	42.5 1.8
26.8	23.81 .26	41.9 0.9	53.16 .27	50.2 1.1	38.47 .28	11.4 0.9	40.18 .31	40.9 1.3
Sept. 5.8	24.10 +.29	41.1 +0.6	53.45 +.29	49.2 +0.7	38.76 +.29	10.6 +0.6	40.49 +.29	39.8 +0.8
15.7	24.39 .29	40.6 +0.3	53.74 .29	48.7 +0.3	39.05 .29	10.1 +0.3	40.81 .29	39.3 +0.3
25.7	24.68 .29	40.5 0.0	54.04 .29	48.7 —0.2	39.34 .29	10.0 0.0	41.14 .29	39.3 —0.3
Oct. 5.7	24.97 .28	40.6 —0.3	54.32 .28	49.0 0.6	39.62 .28	10.1 —0.3	41.45 .31	39.8 0.8
15.7	25.24 .27	41.0 0.6	54.60 .27	49.0 1.0	39.90 .27	10.5 0.6	41.76 .30	40.9 1.3
25.6	25.50 +.25	41.7 —0.8	54.87 +.25	51.1 —1.4	40.16 +.26	11.3 —0.8	42.05 +.26	42.5 —1.8
Nov. 4.6	25.75 .23	42.6 1.0	55.11 .23	52.7 1.7	40.41 .24	12.2 1.0	42.31 .25	44.6 2.2
14.6	25.98 .21	43.7 1.2	55.33 .20	54.6 2.0	40.64 .21	13.4 1.2	42.54 .29	47.0 2.6
24.5	26.17 .18	44.9 1.3	55.52 .17	56.7 2.1	40.84 .19	14.7 1.3	42.74 .18	49.7 2.8
Dec. 4.5	26.34 .15	46.2 1.3	55.68 .14	58.9 2.2	41.01 .15	16.0 1.4	42.90 .14	52.6 2.9
14.5	26.47 +.11	47.5 —1.3	55.79 +.10	61.1 —2.2	41.14 +.11	17.4 —1.4	43.01 +.09	55.5 —2.9
24.5	26.56 .07	48.8 1.2	55.87 +.05	63.3 2.1	41.24 .07	18.8 1.3	43.08 +.04	58.4 2.8
34.4	26.61 +.02	50.0 —1.1	55.90 .00	65.4 —2.0	41.29 +.03	20.0 —1.2	43.09 —.01	61.1 —2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 5 49	+ 7° 23'	^h ^m 6 1	+ 14° 46'	^h ^m 6 6	+ 69° 21'	^h ^m 6 16	+ 22° 34'
(Dec.30.5)	^s 13.24 +.07	7.1 -0.8	^s 17.78 +.08	49.8 -0.4	^s 44.81 +.14	26.8 +2.7	^s 18.62 +.10	8.3 0.0
Jan. 9.5	13.28 +.02	6.4 0.7	17.84 +.03	49.4 0.3	44.88 +.01	29.5 2.6	18.70 +.05	8.4 +0.1
19.4	13.28 -.03	5.7 0.6	17.85 -.02	49.2 0.2	44.84 -.11	32.2 2.5	18.73 .00	8.6 0.2
29.4	13.23 .07	5.2 0.5	17.82 .06	49.0 0.1	44.66 .23	34.6 2.3	18.71 -.05	8.8 0.2
Feb. 8.4	13.14 .11	4.8 0.4	17.74 .10	48.9 -0.1	44.38 .33	36.7 2.0	18.63 .09	9.1 0.3
18.3	13.02 -.14	4.5 -0.2	17.62 -.13	48.8 0.0	43.99 -.42	38.5 +1.6	18.52 -.13	9.3 +0.3
28.3	12.87 .16	4.3 -0.1	17.47 .16	48.8 0.0	43.53 .49	39.9 1.1	18.37 .16	9.6 0.2
Mar. 10.3	12.70 .17	4.2 0.0	17.30 .17	48.9 +0.1	43.02 .53	40.8 0.7	18.20 .18	9.8 0.2
20.3	12.52 .17	4.3 +0.1	17.13 .18	49.0 0.1	42.48 .54	41.2 +0.2	18.02 .18	10.0 0.2
30.2	12.35 .17	4.4 0.2	16.95 .17	49.1 0.1	41.94 .52	41.1 -0.3	17.84 .18	10.1 +0.1
Apr. 9.2	12.19 -.15	4.6 +0.3	16.78 -.15	49.2 +0.1	41.43 -.49	40.5 -0.6	17.66 -.16	10.2 0.0
19.2	12.05 .12	5.0 0.4	16.64 .13	49.4 0.2	40.97 .42	39.5 1.2	17.51 .14	10.2 0.0
29.2	11.95 .09	5.4 0.5	16.53 .10	49.6 0.2	40.59 .34	38.1 1.6	17.36 .11	10.2 0.0
May 9.1	11.87 .05	6.0 0.6	16.45 .06	49.8 0.3	40.29 .25	36.3 1.9	17.29 .07	10.2 0.0
19.1	11.84 -0.1	6.7 0.7	16.41 -.09	50.2 0.4	40.09 .14	34.2 2.1	17.24 -.03	10.1 0.0
29.1	11.86 +0.3	7.5 +0.9	16.42 +.02	50.6 +0.4	40.00 -.03	32.0 -2.3	17.23 +.02	10.1 0.0
June 8.0	11.91 .07	8.4 1.0	16.46 .07	51.0 0.5	40.02 +.06	29.7 2.4	17.27 .06	10.1 0.0
18.0	12.00 .11	9.4 1.0	16.55 .11	51.6 0.6	40.16 .19	27.3 2.4	17.35 .10	10.2 +0.1
28.0	12.14 .15	10.5 1.1	16.68 .15	52.2 0.6	40.40 .29	24.9 2.3	17.47 .14	10.3 0.1
July 8.0	12.31 .18	11.6 1.1	16.85 .18	52.8 0.7	40.74 .39	22.6 2.2	17.63 .18	10.4 0.2
17.9	12.51 +.21	12.7 +1.1	17.05 +.21	53.5 +0.7	41.18 +.46	20.5 -2.0	17.83 +.21	10.6 +0.2
27.9	12.73 .24	13.8 1.1	17.27 .24	54.2 0.7	41.70 .56	18.6 1.8	18.05 .24	10.8 0.2
Aug. 6.9	12.98 .26	14.9 1.0	17.52 .26	54.8 0.6	42.30 .69	16.9 1.5	18.31 .26	11.0 0.2
16.9	13.25 .27	15.8 0.8	17.79 .26	55.4 0.5	42.95 .68	15.5 1.3	18.52 .26	11.1 0.2
26.8	13.53 .28	16.5 0.7	18.07 .29	55.9 0.4	43.66 .79	14.4 1.0	18.87 .30	11.3 0.1
Sept. 5.8	13.82 +.29	17.1 +0.5	18.37 +.30	56.3 +0.3	44.40 +.76	13.6 -0.6	19.17 +.31	11.4 +0.1
15.8	14.11 .29	17.5 +0.3	18.67 .30	56.6 +0.2	45.17 .78	13.2 -0.3	19.49 .32	11.5 0.0
25.7	14.41 .30	17.7 0.0	18.97 .31	56.6 0.0	45.96 .79	13.1 +0.1	19.81 .32	11.4 -0.1
Oct. 5.7	14.70 .29	17.6 -0.2	19.28 .31	56.6 -0.1	46.75 .78	13.3 0.5	20.13 .32	11.3 0.1
15.7	14.99 .29	17.3 0.4	19.59 .30	56.4 0.3	47.52 .77	14.0 0.8	20.45 .32	11.1 0.2
25.7	15.27 +.28	16.8 -0.6	19.88 +.29	56.1 -0.4	48.28 +.73	15.0 +1.2	20.77 +.31	10.9 -0.2
Nov. 4.6	15.54 .26	16.1 0.7	20.17 .28	55.6 0.5	48.99 .69	16.4 1.5	21.08 .30	10.7 0.2
14.6	15.79 .24	15.3 0.8	20.43 .26	55.1 0.5	49.65 .63	18.1 1.9	21.37 .28	10.4 0.2
24.6	16.02 .21	14.4 0.9	20.68 .23	54.5 0.6	50.24 .55	20.1 2.2	21.64 .25	10.2 0.2
Dec. 4.6	16.21 .18	13.5 0.9	20.89 .20	54.0 0.5	50.75 .45	22.4 2.4	21.88 .22	10.0 0.2
14.5	16.37 +.14	12.6 -0.9	21.07 +.16	53.4 -0.5	51.15 +.35	24.9 +2.6	22.08 +.18	9.8 -0.1
24.5	16.49 .10	11.7 0.9	21.21 .19	52.9 0.4	51.44 .23	27.5 2.7	22.25 .14	9.8 0.0
34.5	16.56 +.05	10.8 -0.8	21.30 +.07	52.5 -0.3	51.60 +.09	30.2 +2.7	22.36 +.09	9.8 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argûs. (Canopus.)		γ Geminorum.		α Canis Majoris. (Sirius.)		ϵ Canis Majoris.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h 6 ^m 21	^s —52° 37'	^h 6 ^m 31	^s +16° 29'	^h 6 ^m 40	^s —16° 33'	^h 6 ^m 54	^s —28° 49'
(Dec.30.5)	32.48 +.01	70.7 —3.5	21.70 +.11	31.8 —0.4	18.69 +.09	58.1 —2.3	18.95 +.09	22.2 —2.9
Jan. 9.5	32.46 —.06	74.1 3.9	21.78 .06	31.4 0.3	18.76 +.04	60.3 2.2	19.02 +.01	25.1 2.7
19.4	32.36 .13	77.2 2.9	21.82 +.01	31.2 0.2	18.78 .00	62.4 2.0	19.04 —.01	27.7 2.5
29.4	32.20 .19	80.0 2.6	21.81 —.03	31.1 —0.1	18.75 —.05	64.3 1.7	19.00 .06	30.1 2.3
Feb. 8.4	31.98 .25	82.4 2.2	21.76 .08	31.1 0.0	18.68 .09	65.9 1.4	18.92 .11	32.3 2.0
18.4	31.71 —.29	84.4 —1.7	21.66 —.12	31.2 +0.1	18.56 —.13	67.2 —1.0	18.79 —.15	34.0 —1.6
28.3	31.40 .33	85.9 1.2	21.52 .15	31.3 0.1	18.41 .16	68.1 0.8	18.62 .18	35.4 1.2
Mar. 10.3	31.05 .35	86.9 0.7	21.36 .17	31.4 0.2	18.24 .18	68.8 0.5	18.43 .20	36.4 0.8
20.3	30.69 .36	87.3 —0.2	21.19 .18	31.6 0.2	18.05 .19	69.1 —0.2	18.22 .22	37.0 —0.4
30.3	30.33 .36	87.3 +0.3	21.01 .17	31.8 0.2	17.86 .19	69.1 +0.2	18.00 .22	37.2 0.0
Apr. 9.2	29.98 —.24	86.7 +0.8	20.84 —.16	31.9 +0.2	17.67 —.18	68.8 +0.5	17.78 —.21	37.0 +0.4
19.2	29.65 .31	85.6 1.3	20.69 .14	32.1 0.2	17.50 .16	68.2 0.8	17.57 .19	36.4 0.8
29.2	29.36 .28	84.0 1.8	20.56 .11	32.3 0.2	17.35 .14	67.3 1.1	17.39 .17	35.4 1.2
May 9.1	29.10 .23	82.0 2.2	20.46 .08	32.6 0.2	17.22 .11	66.1 1.3	17.23 .14	34.0 1.5
19.1	28.89 .18	79.7 2.5	20.40 —.04	32.8 0.3	17.13 .07	64.6 1.6	17.11 .10	32.3 1.8
29.1	28.74 —.12	76.9 +2.8	20.38 .00	33.1 +0.3	17.08 —.03	63.0 +1.8	17.02 —.07	30.3 +2.1
June 8.1	28.65 —.06	73.9 3.1	20.40 +.04	33.4 0.4	17.07 +.01	61.1 1.9	16.98 —.03	28.1 2.3
18.0	28.62 .00	70.8 3.2	20.47 .08	33.8 0.4	17.09 .05	59.1 2.0	16.97 +.02	25.6 2.5
28.0	28.64 +.06	67.4 3.3	20.57 .12	34.2 0.4	17.16 .09	57.0 2.1	17.01 .06	23.0 2.6
July 8.0	28.73 .12	64.1 3.3	20.71 .16	34.6 0.4	17.26 .12	54.8 2.1	17.09 .10	20.4 2.6
18.0	28.88 +.17	60.8 +3.2	20.88 +.19	35.1 +0.4	17.40 +.15	52.7 +2.1	17.20 +.13	17.7 +2.6
27.9	29.08 .23	57.7 3.0	21.09 .22	35.5 0.4	17.57 .18	50.6 2.0	17.36 .17	15.2 2.5
Aug. 6.9	29.33 .27	54.8 2.7	21.31 .24	36.0 0.4	17.77 .21	48.7 1.8	17.54 .20	12.8 2.3
16.9	29.63 .22	52.2 2.3	21.57 .26	36.3 0.3	17.99 .23	47.0 1.5	17.76 .23	10.7 2.0
26.8	29.96 .25	50.1 1.9	21.84 .28	36.6 0.2	18.23 .25	45.6 1.2	18.00 .25	8.8 1.6
Sept. 5.8	30.33 +.28	48.5 +1.3	22.12 +.29	36.8 +0.1	18.50 +.27	44.6 +0.9	18.27 +.28	7.4 +1.2
15.8	30.72 .40	47.5 0.7	22.42 .30	36.8 0.0	18.77 .28	43.9 +0.5	18.55 .29	6.4 0.7
25.8	31.13 .41	47.1 +0.1	22.73 .31	36.7 —0.2	19.06 .29	43.7 0.0	18.85 .31	6.0 +0.2
Oct. 5.7	31.54 .41	47.3 —0.5	23.04 .31	36.5 0.3	19.36 .30	43.9 —0.4	19.16 .31	6.1 —0.3
15.7	31.94 .40	48.2 1.2	23.35 .31	36.2 0.4	19.65 .30	44.5 0.0	19.48 .31	6.7 0.2
25.7	32.33 +.28	49.7 —1.8	23.66 +.31	35.7 —0.5	19.95 +.29	45.6 —1.3	19.79 +.31	7.8 —1.4
Nov. 4.7	32.69 .35	51.7 2.3	23.96 .30	35.1 0.6	20.24 .28	47.1 1.6	20.10 .30	9.4 1.8
14.6	33.02 .30	54.3 2.8	24.25 .28	34.5 0.6	20.51 .28	48.9 1.2	20.39 .28	11.4 2.2
24.6	33.30 .25	57.3 3.1	24.52 .26	33.9 0.6	20.76 .24	51.0 2.2	20.66 .25	13.8 2.5
Dec. 4.6	33.53 .19	60.5 3.3	24.77 .23	33.3 0.6	20.98 .21	53.3 2.3	20.90 .22	16.5 2.8
14.5	33.69 +.13	63.9 —3.5	24.98 +.19	32.7 —0.5	21.17 +.17	55.6 —2.4	21.09 +.18	19.3 —2.9
24.5	33.79 +.06	67.4 3.5	25.15 .15	32.2 0.4	21.32 .19	58.0 2.4	21.25 .13	22.2 2.9
34.5	33.81 —.01	70.9 —3.4	25.27 +.10	31.8 —0.3	21.42 +.08	60.4 —2.3	21.36 +.08	25.1 —2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α^2 Geminorum. (Castor.)									
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.								
	^h 7	^m 3	^h 7	^m 13	^h 7	^m 19	^h 7	^m 27								
		-26° 12'		+22° 10'		+68° 41'		+32° 7'								
(Dec.30.5)	55.81	+11	67.2	-2.8	33.46	+1.6	61.8	-0.3	27.51	+2.34	18.7	+2.4	35.19	+1.9	43.3	+0.4
Jan. 9.5	55.89	.06	69.9	2.7	33.60	.11	61.7	0.0	27.78	.21	21.3	2.6	35.36	.14	43.7	0.6
19.5	55.92	+0.1	72.5	2.5	33.68	.06	61.8	+0.1	27.93	+0.08	23.9	2.6	35.47	.09	44.4	0.7
29.4	55.90	-.04	74.9	2.2	33.71	+0.1	61.9	0.2	27.95	-.04	26.5	2.6	35.52	+0.09	45.2	0.8
Feb. 8.4	55.83	.09	77.0	1.9	33.69	-.04	62.2	0.3	27.84	.16	20.1	2.5	35.51	-.04	46.0	0.9
18.4	55.72	-.13	78.8	-1.6	33.63	-.09	62.6	+0.4	27.62	-.27	31.5	+2.2	35.45	-.09	46.9	+0.9
28.4	55.57	.17	80.2	1.2	33.52	.13	63.0	0.4	27.29	.36	33.5	1.9	35.34	.13	47.8	0.8
Mar. 10.3	55.39	.19	81.2	0.8	33.37	.15	63.4	0.4	26.89	.44	35.3	1.5	35.19	.16	48.6	0.7
20.3	55.18	.00	81.8	-0.4	33.21	.17	63.8	0.4	26.42	.48	36.5	1.0	35.01	.18	49.3	0.6
30.3	54.97	.21	82.1	0.0	33.03	.18	64.2	0.3	25.92	.50	37.3	0.6	34.82	.19	49.8	0.5
Apr. 9.3	54.76	-.20	81.9	+0.3	32.85	-.17	64.5	+0.3	25.41	-.50	37.6	+0.1	34.63	-.19	50.2	+0.3
19.2	54.56	.19	81.4	0.7	32.68	.16	64.7	0.2	24.92	.47	37.5	-0.4	34.44	.18	50.5	+0.2
29.2	54.38	.17	80.5	1.1	32.53	.13	64.9	0.2	24.46	.43	36.8	0.9	34.27	.16	50.5	0.0
May 9.2	54.23	.14	79.2	1.4	32.41	.11	65.1	0.1	24.07	.36	35.7	1.3	34.13	.13	50.4	-0.2
19.1	54.11	.10	77.6	1.7	32.32	.07	65.1	+0.1	23.75	.28	34.3	1.6	34.02	.09	50.2	0.3
29.1	54.02	-.07	75.8	+2.0	32.27	-.03	65.2	0.0	23.51	-.19	32.5	-1.9	33.95	-.05	49.9	-0.4
June 8.1	53.97	-.03	73.7	2.2	32.26	+0.1	65.2	0.0	23.37	-.09	30.4	2.2	33.92	-.01	49.4	0.5
18.1	53.96	+0.1	71.4	2.4	32.28	.05	65.2	0.0	23.32	+0.1	28.1	2.4	33.94	+0.4	48.9	0.6
28.0	53.99	.05	68.9	2.5	32.35	.06	65.2	0.0	23.38	.11	25.7	2.5	33.99	.09	48.3	0.6
July 8.0	54.06	.09	66.4	2.5	32.45	.12	65.1	0.0	23.54	.20	23.2	2.5	34.09	.12	47.6	0.7
18.0	54.17	+1.3	63.9	+2.5	32.59	+1.6	65.1	0.0	23.79	+2.30	20.7	-2.5	34.23	+1.5	47.0	-0.7
28.0	54.32	.16	61.4	2.4	32.77	.19	65.0	-0.1	24.13	.39	18.2	2.4	34.40	.19	46.3	0.7
Aug. 6.9	54.49	.19	59.1	2.2	32.97	.21	64.9	0.1	24.56	.47	15.8	2.3	34.60	.22	45.6	0.7
16.9	54.70	.22	57.1	1.9	33.20	.24	64.8	0.2	25.07	.54	13.6	2.1	34.84	.25	44.8	0.7
26.9	54.93	.24	55.3	1.6	33.45	.26	64.6	0.2	25.64	.60	11.6	1.9	35.10	.27	44.1	0.7
Sept. 5.8	55.19	+2.7	53.9	+1.2	33.72	+2.26	64.3	-0.3	26.27	+0.06	9.8	-1.6	35.39	+2.30	43.4	-0.8
15.8	55.47	.20	53.0	0.7	34.01	.30	64.0	0.4	26.95	.70	8.3	1.4	35.70	.32	42.6	0.8
25.8	55.76	.30	52.5	+0.2	34.32	.31	63.5	0.5	27.67	.74	7.1	1.1	36.03	.33	41.8	0.8
Oct. 5.8	56.06	.31	52.5	-0.3	34.64	.32	63.0	0.6	28.42	.76	6.2	0.7	36.37	.35	41.1	0.7
15.7	56.37	.31	53.1	0.8	34.96	.33	62.4	0.6	29.19	.77	5.7	-0.3	36.72	.36	40.3	0.7
25.7	56.69	+3.1	54.1	-1.3	35.29	+3.33	61.7	-0.7	29.97	+7.7	5.6	+0.1	37.06	+3.26	39.7	-0.6
Nov. 4.7	56.99	.30	55.7	1.7	35.62	.33	61.1	0.7	30.74	.78	5.0	0.5	37.45	.36	39.1	0.5
14.7	57.29	.29	57.6	2.1	35.95	.32	60.4	0.7	31.48	.79	6.6	0.9	37.80	.35	38.6	0.4
24.6	57.56	.28	60.0	2.4	36.26	.30	59.7	0.6	32.18	.87	7.6	1.2	38.15	.33	38.2	0.3
Dec. 4.6	57.80	.23	62.5	2.7	36.54	.27	59.2	0.5	32.82	.80	9.1	1.7	38.47	.31	38.0	-0.1
14.6	58.01	+1.9	65.3	-2.8	36.80	+2.24	58.7	-0.4	33.39	+5.1	11.0	+2.0	38.76	+2.27	38.0	+0.1
24.5	58.18	.14	68.1	2.2	37.02	.20	58.4	0.3	33.85	.41	13.2	2.2	39.01	.22	37.2	0.3
34.5	58.30	+1.0	70.9	-2.8	37.19	+1.15	58.2	-0.1	34.21	+2.20	15.6	+2.5	39.21	+1.17	36.6	+0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (Procyon.)		β Geminorum. (Pollux.)		ϕ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 7 33	+ 5° 30'	^h ^m 7 38	+28° 17'	^h ^m 7 46	+27° 2'	^h ^m 8 1	+68° 47'
(Dec.30.5)	^s 32.92 +.16	23.6 -1.3	^s 35.32 +.30	26.6 +0.1	^s 46.13 +.30	58.0 0.0	^s 53.23 +.44	43.8 +2.2
Jan. 9.5	33.06 .12	22.3 1.1	35.49 .14	26.8 0.3	46.31 .15	58.1 +0.2	53.62 .32	46.1 2.4
19.5	33.15 .07	21.3 1.0	35.61 .09	27.2 0.4	46.44 .10	58.4 0.4	53.88 .30	48.6 2.6
29.5	33.19 +.02	20.4 0.8	35.67 +.03	27.7 0.6	46.50 +.04	58.8 0.5	54.01 +.07	51.3 2.7
Feb. 8.4	33.18 -.03	19.7 0.6	35.67 -.02	28.4 0.7	46.52 -.01	59.4 0.6	54.01 -.06	54.0 2.6
18.4	33.13 -.07	19.2 -0.4	35.62 -.07	29.1 +0.7	46.48 -.06	60.0 +0.7	53.89 -.13	56.5 +2.5
28.4	33.04 .11	18.9 0.3	35.53 .11	29.8 0.7	46.39 .11	60.7 0.7	53.65 .29	58.9 2.3
Mar. 10.3	32.91 .14	18.7 -0.1	35.39 .14	30.6 0.7	46.26 .14	61.4 0.7	53.32 .37	61.0 1.9
20.3	32.76 .16	18.7 0.0	35.23 .17	31.2 0.8	46.11 .16	62.1 0.8	52.91 .44	62.8 1.5
30.3	32.60 .17	18.8 +0.2	35.05 .18	31.8 0.5	45.93 .18	62.7 0.5	52.44 .48	64.1 1.1
Apr. 9.3	32.43 -.16	19.0 +0.3	34.86 -.18	32.2 +0.4	45.75 -.18	63.1 +0.4	51.95 -.50	64.9 +0.6
19.2	32.27 .15	19.3 0.4	34.68 .17	32.6 0.2	45.58 .17	63.5 0.3	51.45 .49	65.3 +0.1
29.2	32.12 .14	19.7 0.5	34.52 .15	32.7 +0.1	45.41 .16	63.8 0.2	50.97 .46	65.1 -0.4
May 9.2	32.00 .11	20.2 0.6	34.38 .13	32.8 0.0	45.27 .13	63.9 +0.1	50.52 .42	64.5 0.8
19.2	31.90 .08	20.8 0.6	34.27 .09	32.7 -0.1	45.16 .10	63.9 0.0	50.14 .35	63.4 1.3
29.1	31.83 -.05	21.5 +0.7	34.19 -.05	32.5 -0.2	45.08 -.06	63.8 -0.1	49.83 -.37	62.0 -1.7
June 8.1	31.80 -.01	22.3 0.8	34.16 -.01	32.3 0.3	45.04 -.02	63.6 0.2	49.60 .18	60.1 2.0
18.1	31.80 +.02	23.1 0.8	34.16 +.02	32.0 0.4	45.04 +.02	63.4 0.3	49.46 -.09	58.0 2.2
28.0	31.84 .05	23.9 0.8	34.20 .06	31.6 0.4	45.08 .06	63.1 0.3	49.41 .00	55.7 2.4
July 8.0	31.91 .09	24.8 0.9	34.28 .10	31.2 0.4	45.15 .09	62.7 0.4	49.46 +.10	53.2 2.6
18.0	32.02 +.12	25.6 +0.8	34.40 +.14	30.7 -0.5	45.26 +.13	62.2 -0.5	49.60 +.19	50.5 -2.6
28.0	32.15 .15	26.4 0.8	34.56 .17	30.2 0.5	45.41 .16	61.8 0.5	49.84 .28	47.9 2.6
Aug. 6.9	32.32 .18	27.1 0.7	34.74 .20	29.6 0.6	45.59 .19	61.3 0.5	50.16 .37	45.2 2.6
16.9	32.50 .20	27.7 0.5	34.96 .23	29.0 0.6	45.79 .22	60.7 0.6	50.57 .45	42.7 2.5
26.9	32.72 .22	28.2 0.3	35.20 .26	28.4 0.7	46.03 .25	60.0 0.7	51.05 .52	40.2 2.4
Sept. 5.9	32.95 +.24	28.4 +0.1	35.47 +.28	27.7 -0.7	46.28 +.27	59.4 -0.7	51.61 +.58	37.9 -2.2
15.8	33.21 .26	28.4 -0.1	35.76 .30	27.0 0.8	46.57 .29	58.6 0.8	52.22 .64	35.8 1.9
25.8	33.48 .28	28.2 0.3	36.07 .32	26.2 0.8	46.87 .31	57.8 0.8	52.89 .69	34.0 1.7
Oct. 5.8	33.77 .29	27.8 0.6	36.39 .33	25.4 0.8	47.19 .33	57.0 0.9	53.61 .73	32.5 1.4
15.7	34.07 .30	27.1 0.8	36.73 .34	24.6 0.8	47.53 .34	56.1 0.9	54.36 .76	31.3 1.0
25.7	34.37 +.31	26.1 -1.0	37.08 +.35	23.8 -0.8	47.87 +.35	55.2 -0.9	55.13 +.78	30.5 -0.6
Nov. 4.7	34.68 .31	25.0 1.2	37.43 .35	23.0 0.7	48.22 .35	54.3 0.8	55.91 .78	30.1 -0.2
14.7	34.99 .30	23.7 1.4	37.78 .34	22.3 0.6	48.57 .34	53.5 0.7	56.69 .76	30.2 +0.3
24.6	35.28 .28	22.3 1.4	38.12 .33	21.7 0.5	48.91 .33	52.8 0.6	57.44 .73	30.7 0.7
Dec. 4.6	35.55 .26	20.8 1.5	38.44 .31	21.2 0.4	49.23 .31	52.2 0.5	58.15 .68	31.6 1.2
14.6	35.80 +.23	19.4 -1.4	38.73 +.27	20.9 -0.2	49.52 +.26	51.8 -0.3	58.79 +.60	33.0 +1.6
24.6	36.02 .19	18.0 1.4	38.98 .23	20.8 0.0	49.78 .24	51.6 -0.1	59.35 .51	34.8 1.9
34.5	36.19 +.15	16.7 -1.3	39.18 +.18	20.9 +0.2	50.00 +.19	51.5 +0.1	59.81 +.40	36.9 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argûs (ρ)		η Cancri.		ϵ Hydre.		ι Ursæ Majoris.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 8 ^m 2	[°] 23 ['] 59	^h 8 ^m 26	[°] 20 ['] 48	^h 8 ^m 40	[°] 6 ['] 49	^h 8 ^m 51	[°] 48 ['] 28
(Dec. 30.6	52.11 +.17	10.8 -2.8	21.00 +.23	50.1 -0.5	57.17 +.23	19.9 -1.4	40.73 +.34	17.3 +0.8
Jan. 9.5	52.25 .12	13.6 2.7	21.21 .18	49.7 0.3	57.37 .18	18.6 1.3	41.03 .27	18.2 1.1
19.5	52.35 .07	16.3 2.6	21.37 .13	49.4 -0.1	57.53 .13	17.4 1.1	41.28 .21	19.5 1.4
29.5	52.40 +.02	18.8 2.4	21.48 .08	49.4 +0.1	57.64 .08	16.5 0.8	41.45 .14	21.0 1.6
Feb. 8.5	52.39 -.03	21.1 2.2	21.53 +.03	49.5 0.2	57.70 +.03	15.7 0.6	41.55 +.06	22.8 1.8
18.4	52.33 -.08	23.2 -1.9	21.53 -.02	49.8 +0.4	57.71 -.01	15.2 -0.4	41.57 -.01	24.6 +1.9
28.4	52.23 .12	24.9 1.6	21.48 .07	50.3 0.5	57.67 .05	14.9 0.2	41.53 .07	26.5 1.8
Mar. 10.4	52.09 .15	26.3 1.2	21.39 .11	50.8 0.6	57.59 .09	14.7 -0.1	41.42 .13	28.3 1.7
20.4	51.93 .17	27.3 0.8	21.27 .14	51.4 0.6	57.49 .12	14.8 +0.1	41.27 .18	30.0 1.6
30.3	51.75 .19	27.9 0.5	21.12 .15	52.0 0.6	57.35 .14	14.9 0.2	41.07 .21	31.5 1.3
Apr. 9.3	51.55 -.19	28.2 -0.1	20.97 -.16	52.6 +0.5	57.21 -.15	15.2 +0.3	40.84 -.23	32.7 +1.1
19.3	51.36 .19	28.2 +0.2	20.80 .16	53.1 0.5	57.06 .15	15.6 0.4	40.61 .24	33.6 0.7
29.3	51.18 .17	27.7 0.6	20.65 .15	53.5 0.4	56.91 .14	16.0 0.5	40.37 .23	34.2 0.4
May 9.2	51.01 .15	27.0 0.9	20.50 .13	53.9 0.3	56.77 .13	16.5 0.5	40.14 .21	34.4 +0.1
19.2	50.87 .13	25.8 1.3	20.38 .11	54.2 0.3	56.65 .11	17.1 0.6	39.94 .19	34.3 -0.3
29.2	50.75 -.10	24.5 +1.5	20.29 -.08	54.5 +0.2	56.56 -.08	17.7 +0.6	39.77 -.16	33.8 -0.6
June 8.1	50.67 .07	22.8 1.8	20.22 .05	54.6 +0.1	56.49 .06	18.3 0.6	39.63 .12	33.0 0.9
18.1	50.62 -.04	20.9 2.0	20.19 -.02	54.7 0.0	56.44 -.03	19.0 0.7	39.54 .07	32.0 1.2
28.1	50.60 .00	18.8 2.1	20.19 +.02	54.7 0.0	56.43 .00	19.6 0.7	39.49 -.03	30.7 1.4
July 8.1	50.62 +.03	16.6 2.2	20.22 .05	54.6 -0.1	56.44 +.03	20.3 0.6	39.48 +.02	29.2 1.6
18.0	50.67 +.07	14.4 +2.2	20.29 +.06	54.4 -0.2	56.49 +.06	20.9 +0.6	39.52 +.06	27.5 -1.8
28.0	50.75 .10	12.2 2.2	20.39 .11	54.2 0.3	56.56 .09	21.5 0.5	39.61 .11	25.7 1.9
Aug. 7.0	50.87 .13	10.0 2.1	20.52 .14	53.9 0.4	56.67 .12	21.9 0.4	39.74 .15	23.7 2.0
17.0	51.02 .17	8.0 1.9	20.68 .17	53.5 0.5	56.80 .14	22.3 0.3	39.92 .20	21.7 2.1
26.0	51.21 .20	6.2 1.6	20.86 .20	53.0 0.6	56.95 .17	22.5 +0.1	40.13 .24	19.6 2.1
Sept. 5.9	51.42 +.22	4.7 +1.3	21.08 +.22	52.3 -0.7	57.14 +.20	22.5 -0.1	40.39 +.28	17.5 -2.1
15.9	51.65 .25	3.7 0.9	21.32 .25	51.6 0.8	57.35 .23	22.3 0.3	40.69 .29	15.5 2.0
25.8	51.92 .27	3.0 +0.4	21.58 .28	50.7 0.9	57.59 .25	21.9 0.5	41.02 .35	13.5 1.9
Oct. 5.8	52.20 .29	2.8 0.0	21.87 .30	49.7 1.0	57.85 .27	21.2 0.8	41.39 .38	11.6 1.8
15.8	52.50 .31	3.1 -0.5	22.18 .32	48.6 1.1	58.13 .29	20.3 1.0	41.79 .41	9.8 1.7
25.8	52.82 +.32	3.9 -1.0	22.50 +.33	47.4 -1.2	58.43 +.31	19.2 -1.2	42.22 +.44	8.2 -1.5
Nov. 4.7	53.14 .32	5.1 1.5	22.84 .34	46.2 1.2	58.74 .32	17.9 1.4	42.67 .45	6.9 1.2
14.7	53.45 .31	6.9 1.9	23.18 .34	44.9 1.2	59.07 .32	16.4 1.5	43.13 .48	5.8 0.9
24.7	53.76 .30	9.0 2.3	23.52 .33	43.7 1.1	59.39 .31	14.8 1.6	43.59 .46	5.0 0.6
Dec. 4.7	54.05 .28	11.4 2.5	23.85 .32	42.6 1.0	59.70 .30	13.2 1.6	44.04 .44	4.6 -0.2
14.6	54.31 +.24	14.0 -2.7	24.15 +.29	41.6 -0.9	60.00 +.28	11.5 -1.6	44.47 +.41	4.6 +0.2
24.6	54.54 .20	16.8 2.8	24.43 .26	40.8 0.7	60.27 .25	9.9 1.5	44.86 .37	5.0 0.5
34.6	54.72 +.16	19.6 -2.8	24.68 +.22	40.2 -0.5	60.50 +.21	8.5 -1.4	45.21 +.32	5.7 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Ursæ Majoris.		κ Cancrî.		ι Argûs.		γ Draconis (H.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h 9	^m 0	^h 9	^m 1	^h 9	^m 14	^h 9	^m 21
		+67° 34'		+11° 6'		-58° 48'		+81° 48'
(Dec. 30.6)	^s 43.50	+54	^s 47.41	+25	^s 10.13	+31	^s 25.63	+1.37
Jan. 9.6	44.00 .44	44.1 2.0	47.63 .21	37.2 1.1	10.40 .23	37.3 3.6	26.89 1.13	35.1 2.3
19.6	44.38 .33	46.2 2.3	47.82 .16	36.2 0.9	10.60 .15	41.0 3.7	27.90 .87	37.7 2.7
29.5	44.66 .21	48.7 2.5	47.95 .11	35.4 0.6	10.71 +.07	44.8 3.7	28.62 .57	40.5 2.9
Feb. 8.5	44.81 +.09	51.3 2.6	48.04 .06	34.9 0.4	10.73 -.01	48.5 3.6	29.04 +.26	43.5 3.1
18.5	44.84 -.03	54.0 +2.7	48.07 +.01	34.6 -.02	10.68 -.09	52.1 -3.4	29.14 -.05	46.6 +3.1
28.4	44.75 .14	56.6 2.6	48.05 -.04	34.5 0.0	10.55 .16	55.4 3.2	28.94 .35	49.7 3.0
Mar. 10.4	44.55 .24	59.1 2.4	47.99 .08	34.6 +0.1	10.35 .23	58.4 2.9	28.45 .62	52.6 2.7
20.4	44.27 .32	61.3 2.1	47.90 .11	34.3 0.3	10.09 .28	61.1 2.5	27.70 .86	55.2 2.4
30.4	43.91 .39	63.3 1.7	47.78 .13	35.2 0.4	9.79 .32	63.4 2.0	26.74 1.05	57.4 2.0
Apr. 9.3	43.49 -.43	64.8 +1.3	47.65 -.14	35.6 +0.4	9.46 -.35	65.2 -1.6	25.60 -1.19	59.2 +1.5
19.3	43.05 .45	65.8 0.8	47.50 .14	36.0 0.5	9.10 .36	66.5 1.1	24.35 1.28	60.5 1.0
29.3	42.59 .45	66.4 +0.3	47.36 .14	36.5 0.5	8.73 .37	67.3 -0.6	23.04 1.32	61.2 +0.4
May 9.3	42.15 .43	66.5 -0.2	47.22 .13	37.1 0.5	8.36 .37	67.6 0.0	21.72 1.30	61.3 -0.2
19.2	41.74 .39	66.0 0.6	47.10 .11	37.6 0.5	8.00 .35	67.4 +0.5	20.44 1.24	60.9 0.7
29.2	41.37 -.34	65.2 -1.1	46.99 -.09	38.1 +0.5	7.65 -.33	66.7 +1.0	19.25 -1.13	59.9 -1.2
June 8.2	41.06 .28	63.9 1.5	46.91 .07	38.6 0.5	7.34 .30	65.4 1.4	18.18 .99	58.4 1.7
18.1	40.82 .20	62.2 1.9	46.86 .04	39.1 0.5	7.06 .28	63.8 1.9	17.27 .82	56.4 2.2
28.1	40.65 .13	60.2 2.2	46.83 -.01	39.5 0.4	6.82 .29	61.7 2.3	16.54 .69	54.1 2.5
July 8.1	40.56 -.05	57.8 2.4	46.83 +.01	39.9 0.4	6.62 .16	59.3 2.6	16.02 .41	51.4 2.8
18.1	40.56 +.04	55.3 -2.6	46.86 +.04	40.3 +0.3	6.49 -.11	56.6 +2.8	15.72 -.19	48.4 -3.1
28.0	40.63 .12	52.6 2.8	46.92 .07	40.5 0.2	6.41 -.05	53.6 3.0	15.64 +.04	45.2 3.2
Aug. 7.0	40.79 .20	49.7 2.9	47.00 .10	40.7 +0.1	6.39 +.01	50.6 3.0	15.79 .27	41.9 3.3
17.0	41.04 .28	46.9 2.9	47.12 .13	40.7 0.0	6.44 .08	47.6 3.0	16.17 .49	38.5 3.4
27.0	41.36 .36	44.0 2.8	47.26 .16	40.6 -0.2	6.55 .15	44.6 2.9	16.78 .71	35.1 3.3
Sept. 5.9	41.75 +.43	41.2 -2.8	47.43 +.18	40.3 -0.4	6.74 +.22	41.8 +2.6	17.60 +.22	31.9 -3.2
15.9	42.22 .50	38.5 2.6	47.63 .21	39.9 0.6	6.93 .28	39.4 2.3	18.62 1.12	28.7 3.1
25.9	42.75 .56	35.9 2.4	47.85 .24	39.2 0.8	7.30 .34	37.3 1.8	19.84 1.30	25.8 2.8
Oct. 5.8	43.34 .62	33.6 2.2	48.10 .26	38.3 1.0	7.67 .39	35.7 1.3	21.23 1.46	23.1 2.5
15.8	43.99 .67	31.6 1.9	48.38 .29	37.3 1.2	8.08 .44	34.7 0.7	22.77 1.60	20.8 2.1
25.8	44.68 +.71	29.9 -1.5	48.68 +.31	36.0 -1.3	8.54 +.47	34.3 +0.1	24.44 +1.71	18.9 -1.7
Nov. 4.8	45.40 .73	28.6 1.1	49.00 .32	34.6 1.5	9.03 .49	34.6 -0.6	26.20 1.79	17.4 1.2
14.7	46.14 .74	27.7 0.7	49.32 .33	33.1 1.6	9.52 .49	35.5 1.2	28.01 1.82	16.4 0.7
24.7	46.89 .73	27.3 -0.2	49.65 .33	31.5 1.6	10.01 .48	37.0 1.2	29.85 1.82	16.0 -0.1
Dec. 4.7	47.62 .71	27.4 +0.3	49.98 .32	29.8 1.6	10.48 .45	39.2 2.4	31.65 1.76	16.2 +0.4
14.7	48.31 +.66	27.9 +0.8	50.29 +.30	28.3 -1.5	10.92 +.41	41.8 -2.9	33.37 +1.66	16.9 +1.0
24.6	48.94 .60	29.0 1.3	50.58 .27	26.8 1.4	11.30 .35	44.9 3.3	34.96 1.51	18.2 1.5
34.6	49.50 +.51	30.5 +1.7	50.84 +.23	25.5 -1.3	11.62 +.26	48.3 -3.6	36.37 +1.29	20.0 +2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Hydræ.		δ Ursæ Majoris.		θ Ursæ Majoris.		ϵ Leonis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 9 ^m 22	— 8° 10'	^h 9 ^m 24	+70° 18'	^h 9 ^m 25	+52° 10'	^h 9 ^m 39	+24° 16'
(Dec.30.6)	^s 10.97 +.25	50.6 —2.3	^s 45.78 +.63	38.7 +1.4	^s 29.99 +.39	34.3 +0.6	^s 36.31 +.39	47.0 —0.8
Jan. 9.6	11.20 .21	52.8 2.1	46.38 .54	40.3 1.9	30.36 .33	35.2 1.0	36.58 .26	46.3 0.5
19.6	11.39 .16	54.9 2.0	46.87 .43	42.4 2.3	30.66 .27	36.4 1.4	36.82 .21	46.0 —0.2
29.5	11.53 .11	56.9 1.8	47.23 .30	44.8 2.5	30.89 .19	38.0 1.7	37.01 .16	45.9 +0.1
Feb. 8.5	11.62 .07	58.6 1.6	47.46 .16	47.5 2.7	31.04 .11	39.8 1.9	37.14 .11	46.1 0.3
18.5	11.66 +.02	60.1 —1.4	47.55 +.03	50.3 +2.8	31.12 +.04	41.8 +2.0	37.22 +.05	46.5 +0.5
28.4	11.66 —.03	61.4 1.1	47.51 —.10	53.1 2.7	31.12 —.04	43.9 2.1	37.24 .00	47.2 0.7
Mar. 10.4	11.61 .07	62.4 0.9	47.34 .22	55.8 2.6	31.05 .10	46.0 2.0	37.22 —.04	48.0 0.9
20.4	11.52 .10	63.1 0.6	47.06 .33	58.2 2.3	30.91 .16	48.0 1.9	37.15 .06	48.9 0.9
30.4	11.41 .12	63.6 0.4	46.69 .41	60.4 2.0	30.73 .20	49.8 1.7	37.05 .11	49.8 0.9
Apr. 9.3	11.29 —.13	63.8 —0.1	46.25 —.46	62.2 +1.6	30.50 —.23	51.4 +1.4	36.93 —.13	50.8 +0.9
19.3	11.15 .14	63.9 +0.1	45.76 .50	63.5 1.1	30.26 .25	52.6 +1.1	36.79 .14	51.6 0.8
29.3	11.00 .14	63.7 0.3	45.25 .51	64.4 0.6	30.01 .25	53.5 0.7	36.64 .15	52.4 0.7
May 9.3	10.86 .13	63.3 0.5	44.74 .50	64.7 +0.1	29.76 .24	54.1 +0.3	36.50 .14	53.1 0.6
19.2	10.73 .12	62.7 0.7	44.24 .47	64.5 —0.4	29.52 .23	54.2 —0.1	36.36 .13	53.6 0.5
29.2	10.62 —.11	61.9 +0.8	43.79 —.43	63.9 —0.9	29.30 —.20	53.9 —0.5	36.24 —.11	54.0 +0.3
June 8.2	10.52 .09	61.0 1.0	43.39 .37	62.7 1.4	29.12 .16	53.3 0.8	36.13 .09	54.3 +0.2
18.1	10.45 .06	60.0 1.1	43.06 .30	61.1 1.8	28.98 .12	52.3 1.1	36.05 .07	54.3 0.6
28.1	10.40 .04	58.9 1.2	42.80 .21	59.2 2.1	28.67 .06	51.0 1.4	35.99 .04	54.3 —0.2
July 8.1	10.37 —.01	57.6 1.2	42.63 .13	56.9 2.4	28.81 —.04	49.4 1.7	35.96 —.02	54.0 0.3
18.1	10.37 +.01	56.4 +1.3	42.54 —.04	54.3 —2.7	28.80 +.01	47.6 —1.9	35.96 +.01	53.7 —0.5
28.0	10.39 .04	55.1 1.2	42.55 +.05	51.5 2.9	28.83 .06	45.6 2.1	35.99 .04	53.1 0.6
Aug. 7.0	10.45 .07	53.9 1.1	42.65 .14	48.5 3.0	28.91 .11	43.4 2.3	36.04 .07	52.4 0.8
17.0	10.53 .10	52.8 1.0	42.84 .24	45.5 3.1	29.04 .15	41.0 2.4	36.13 .10	51.6 0.9
27.0	10.64 .13	51.9 0.8	43.12 .33	42.4 3.1	29.22 .20	38.6 2.4	36.24 .13	50.6 1.1
Sept. 5.9	10.78 +.15	51.1 +0.8	43.49 +.41	39.3 —3.0	29.44 +.24	36.1 —2.5	36.39 +.16	49.5 —1.2
15.9	10.95 .19	50.7 +0.3	43.95 .50	36.4 2.9	29.71 .29	33.7 2.5	36.56 .19	48.2 1.4
25.9	11.15 .22	50.5 0.0	44.49 .58	33.5 2.7	30.02 .33	31.2 2.4	36.77 .23	46.8 1.5
Oct. 5.8	11.38 .24	50.6 —0.3	45.10 .65	30.9 2.5	30.38 .37	28.9 2.3	37.02 .26	45.2 1.6
15.8	11.64 .27	51.1 0.7	45.78 .71	28.5 2.2	30.77 .41	26.7 2.1	37.29 .29	43.6 1.7
25.8	11.92 +.29	52.0 —1.0	46.51 +.76	26.5 —1.8	31.20 +.45	24.7 —1.9	37.59 +.21	41.8 —1.7
Nov. 4.8	12.23 .31	53.2 1.4	47.30 .80	24.9 1.4	31.66 .47	22.9 1.6	37.92 .33	40.1 1.7
14.7	12.54 .32	54.7 1.7	48.11 .82	23.7 1.0	32.14 .49	21.5 1.3	38.26 .26	38.4 1.7
24.7	12.87 .32	56.5 1.9	48.94 .83	23.0 —0.5	32.64 .49	20.3 0.9	38.62 .26	36.7 1.6
Dec. 4.7	13.19 .31	58.6 2.1	49.77 .81	22.8 0.0	33.13 .48	19.6 0.5	38.96 .26	35.1 1.5
14.7	13.50 +.30	60.7 —2.2	50.56 +.77	23.1 +0.5	33.60 +.46	19.3 —0.1	39.33 +.24	33.8 —1.3
24.6	13.79 .27	63.0 2.3	51.29 .70	23.9 1.1	34.05 .43	19.4 +0.3	39.66 .22	32.6 1.8
34.6	14.04 +.24	65.2 —2.2	51.96 +.61	25.3 +1.6	34.45 +.38	20.0 +0.8	39.96 +.22	31.8 —0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Leonis.		α Leonis. (Regulus.)		32 Ursæ Majoris.		γ^1 Leonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 9 ^m 46	⁺ 26° 31'	^h 10 ^m 2	⁺ 12° 30'	^h 10 ^m 10	⁺ 65° 38'	^h 10 ^m 13	⁺ 20° 23'
(Dec.30.6)	^s 30.29 +.31	26.1 -0.8	^s 30.61 +.29	16.9 -1.4	^s 2.82 +.60	73.7 +0.7	^s 54.19 +.31	50.3 -1.2
Jan. 9.6	30.58 .97	25.5 0.4	30.88 .25	15.6 1.2	3.39 .53	74.7 1.2	54.49 .98	49.2 0.9
19.6	30.82 .29	25.2 -0.1	31.12 .21	14.4 1.0	3.88 .45	76.2 1.7	54.75 .94	48.5 0.6
29.6	31.02 .17	25.2 +0.2	31.31 .16	13.6 0.7	4.29 .35	78.1 2.1	54.96 .19	48.0 -0.3
Feb. 8.5	31.16 .11	25.5 0.5	31.46 .12	13.0 0.5	4.58 .24	80.4 2.4	55.13 .14	47.8 0.0
18.5	31.25 +.06	26.1 +0.7	31.55 +.07	12.6 -0.2	4.77 +.13	82.9 +2.6	55.24 +.09	48.0 +0.3
28.5	31.28 +.01	26.9 0.8	31.60 +.02	12.5 0.0	4.85 +.02	85.6 2.7	55.30 +.04	48.3 0.5
Mar. 10.5	31.26 -.04	27.8 0.9	31.60 -.02	12.7 +0.2	4.82 -.08	88.3 2.7	55.31 -.01	48.9 0.7
20.4	31.20 .08	28.8 1.0	31.55 .05	13.0 0.4	4.69 .17	90.9 2.5	55.28 .05	49.7 0.8
30.4	31.11 .11	29.9 1.0	31.48 .08	13.4 0.5	4.48 .25	93.4 2.3	55.21 .08	50.5 0.9
Apr. 9.4	30.98 -.13	30.9 +1.0	31.38 -.11	14.0 +0.6	4.20 -.31	95.5 +2.0	55.12 -.10	51.4 +0.9
19.3	30.84 .14	31.9 0.9	31.26 .12	14.6 0.6	3.86 .36	97.4 1.6	55.00 .12	52.3 0.9
29.3	30.69 .15	32.7 0.8	31.14 .13	15.2 0.7	3.48 .38	98.7 1.2	54.88 .13	53.2 0.8
May 9.3	30.54 .14	33.5 0.6	31.01 .13	15.9 0.6	3.09 .39	99.7 0.7	54.75 .13	53.9 0.7
19.3	30.40 .13	34.0 0.5	30.88 .11	16.5 0.6	2.69 .39	100.1 +0.2	54.62 .12	54.6 0.6
29.2	30.28 -.12	34.4 +0.3	30.77 -.10	17.1 +0.5	2.31 -.37	100.0 -0.3	54.50 -.11	55.2 +0.5
June 8.2	30.17 .10	34.6 +0.1	30.67 .09	17.6 0.5	1.96 .33	99.5 0.8	54.39 .10	55.6 0.4
18.2	30.08 .08	34.7 -0.1	30.58 .07	18.1 0.4	1.64 .29	98.5 1.2	54.30 .08	55.9 0.2
28.2	30.02 .05	34.5 0.9	30.52 .05	18.4 0.4	1.38 .24	97.0 1.6	54.22 .06	56.1 +0.1
July 8.1	29.98 -.08	34.2 0.4	30.48 .03	18.8 0.3	1.17 .18	95.2 2.0	54.17 .04	56.0 -0.1
18.1	29.97 +.01	33.7 -0.6	30.45 -.01	19.0 +0.1	1.02 -.12	93.0 -2.3	54.14 -.02	55.9 -0.2
28.1	29.99 .03	33.0 0.7	30.46 +.01	19.1 0.0	0.94 -.05	90.5 2.6	54.13 +.01	55.6 0.4
Aug. 7.0	30.04 .08	32.2 0.9	30.48 .04	19.0 0.0	0.92 +.02	87.8 2.8	54.15 .03	55.1 0.6
17.0	30.11 .09	31.2 1.1	30.54 .06	18.8 -0.2	0.98 .09	84.8 3.0	54.20 .06	54.4 0.8
27.0	30.22 .12	30.1 1.2	30.62 .09	18.5 0.4	1.10 .16	81.7 3.1	54.28 .09	53.5 0.9
Sept. 6.0	30.36 +.16	28.8 -1.4	30.73 +.12	18.0 -0.6	1.30 +.24	78.6 -3.2	54.38 +.12	52.5 -1.1
15.9	30.54 .19	27.4 1.5	30.88 .15	17.3 0.8	1.58 .31	75.4 3.2	54.52 .15	51.3 1.3
25.9	30.74 .22	25.8 1.6	31.05 .19	16.3 1.0	1.92 .38	72.3 3.1	54.69 .19	50.0 1.5
Oct. 5.9	30.98 .26	24.1 1.7	31.26 .22	15.2 1.2	2.34 .45	69.3 2.9	54.90 .22	48.4 1.6
15.9	31.26 .29	22.4 1.8	31.50 .25	13.9 1.4	2.82 .52	66.4 2.7	55.14 .26	46.7 1.8
25.8	31.56 +.31	20.6 -1.8	31.77 +.28	12.4 -1.6	3.37 +.57	63.8 -2.5	55.41 +.29	44.9 -1.9
Nov. 4.8	31.88 .33	18.7 1.8	32.06 .31	10.7 1.8	3.97 .62	61.5 2.1	55.71 .31	43.0 1.9
14.8	32.23 .35	16.9 1.7	32.38 .32	8.9 1.8	4.61 .66	59.6 1.7	56.04 .33	41.1 1.9
24.7	32.59 .36	15.2 1.6	32.71 .33	7.0 1.9	5.29 .68	58.1 1.2	56.38 .35	39.1 1.9
Dec. 4.7	32.96 .36	13.7 1.4	33.05 .34	5.1 1.9	5.98 .69	57.1 0.7	56.74 .35	37.3 1.8
14.7	33.31 +.35	12.3 -1.2	33.39 +.33	3.3 -1.8	6.66 +.67	56.6 -0.2	57.09 +.34	35.6 -1.6
24.7	33.66 .33	11.2 1.0	33.71 .31	1.6 1.6	7.32 .64	56.7 +0.4	57.43 .33	34.1 1.4
34.6	33.97 +.30	10.4 -0.7	34.01 +.28	0.1 -1.4	7.94 +.58	57.3 +0.9	57.75 +.31	32.8 -1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argus.		ι Leonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h ^m 10 25	+76° 16'	^h ^m 10 27	+ 9° 52'	^h ^m 10 40	-59° 6'	^h ^m 10 43	+11° 7'
(Dec.30.6)	^s 45.39+1.00	^s 33.9 +0.9	^s 0.85 +.30	^s 22.0 -1.7	^s 48.19 +.44	^s 2.1 -2.8	^s 28.13 +.31	^s 38.6 -1.7
Jan. 9.6	46.34 .90	35.1 1.4	1.14 .27	20.5 1.5	48.60 .36	5.1 3.2	28.43 .36	37.0 1.5
19.6	47.18 .76	36.8 1.9	1.40 .23	19.1 1.2	48.95 .32	8.4 3.5	28.70 .35	35.6 1.2
29.6	47.87 .61	39.0 2.4	1.61 .19	18.0 1.0	49.23 .24	12.0 3.6	28.93 .30	34.6 0.9
Feb. 8.5	48.39 .43	41.5 2.7	1.78 .14	17.2 0.7	49.43 .17	15.7 3.7	29.11 .16	33.7 0.7
18.5	48.74 +.25	44.3 +2.9	1.89 +.09	16.6 -0.4	49.56 +.09	19.4 -3.7	29.24 +.11	33.2 -0.4
28.5	48.89 +.06	47.3 3.0	1.96 +.04	16.3 -0.2	49.61 +.01	23.1 3.6	29.33 .06	33.0 -0.1
Mar. 10.5	48.86 -1.11	50.3 3.0	1.98 .00	16.3 +0.1	49.59 -.06	26.6 3.4	29.37 +.02	33.0 +0.1
20.4	48.66 .26	53.2 2.8	1.97 -.03	16.4 0.2	49.49 .12	29.9 3.1	29.37 -.02	33.2 0.3
30.4	48.30 .43	55.9 2.5	1.92 .06	16.8 0.4	49.34 .18	32.9 2.8	29.33 .06	33.6 0.5
Apr. 9.4	47.81 -.55	58.3 +2.2	1.84 -.09	17.2 +0.5	49.14 -.23	35.6 -2.5	29.27 -.06	34.2 +0.6
19.4	47.21 .64	60.3 1.8	1.74 .11	17.8 0.6	48.89 .26	37.8 2.1	29.18 .10	34.8 0.7
29.3	46.53 .70	61.8 1.3	1.63 .12	18.4 0.6	48.61 .22	39.7 1.6	29.08 .11	35.5 0.7
May 9.3	45.80 .74	62.8 0.7	1.51 .12	19.0 0.6	48.31 .31	41.1 1.1	28.96 .11	36.2 0.7
19.3	45.06 .74	63.3 +0.2	1.39 .12	19.7 0.6	47.98 .32	42.0 0.7	28.85 .11	36.9 0.7
29.3	44.32 -.72	63.3 -0.3	1.28 -.11	20.3 +0.6	47.66 -.23	42.4 -0.2	28.74 -.11	37.5 +0.6
June 8.2	43.61 .68	62.6 0.9	1.17 .10	20.9 0.6	47.33 .32	42.3 +0.3	28.63 .10	38.1 0.6
18.2	42.97 .61	61.5 1.4	1.08 .06	21.4 0.5	47.01 .31	41.7 0.8	28.53 .09	38.7 0.5
28.2	42.39 .53	59.9 1.8	1.00 .07	21.9 0.4	46.71 .29	40.7 1.3	28.45 .06	39.1 0.4
July 8.1	41.91 .43	57.8 2.3	0.94 .05	22.3 0.4	46.43 .26	39.2 1.7	28.38 .06	39.5 0.3
18.1	41.53 -.32	55.3 -2.6	0.91 -.03	22.6 +0.3	46.19 -.22	37.2 +2.1	28.33 -.04	39.8 +0.2
28.1	41.26 .21	52.6 2.9	0.89 -.01	22.8 +0.1	45.99 .18	34.9 2.4	28.30 -.02	39.9 +0.1
Aug. 7.1	41.11 -.09	49.5 3.2	0.89 +.02	22.9 0.0	45.83 .13	32.4 2.6	28.29 .00	39.9 -0.1
17.0	41.09 +.04	46.2 3.4	0.92 .04	22.9 -0.1	45.73 -.07	29.6 2.8	28.31 +.03	39.7 0.2
27.0	41.19 .17	42.8 3.5	0.98 .07	22.6 0.3	45.70 .00	26.8 2.8	28.35 .06	39.4 0.4
Sept. 6.0	41.43 +.30	39.3 -3.5	1.07 +.10	22.2 -0.5	45.73 +.07	24.0 +2.8	28.42 +.09	38.9 -0.6
16.0	41.80 .43	35.8 3.5	1.18 .13	21.6 0.7	45.83 .14	21.3 2.6	28.52 .12	38.2 0.8
25.9	42.20 .56	32.3 3.4	1.33 .17	20.7 1.0	46.01 .22	18.7 2.4	28.65 .15	37.3 1.1
Oct. 5.9	42.91 .68	29.0 3.9	1.52 .20	19.7 1.2	46.26 .29	16.6 2.0	28.82 .19	36.1 1.3
15.9	43.65 .79	25.9 2.9	1.74 .23	18.4 1.4	46.59 .36	14.8 1.5	29.03 .22	34.7 1.5
25.8	44.50 +.20	23.1 -2.6	1.99 +.27	16.9 -1.6	46.97 +.41	13.5 +1.0	29.27 +.26	33.1 -1.7
Nov. 4.8	45.45 .26	20.7 2.2	2.27 .30	15.2 1.8	47.42 .46	12.8 +0.2	29.54 .29	31.3 1.8
14.8	46.47 1.05	18.7 1.8	2.58 .39	13.4 1.9	47.90 .50	12.7 -0.2	29.84 .31	29.4 1.9
24.7	47.55 1.10	17.2 1.3	2.90 .33	11.4 2.0	48.41 .52	13.3 0.9	30.17 .33	27.4 2.0
Dec. 4.7	48.66 1.11	16.2 0.7	3.24 .34	9.4 2.0	48.93 .52	14.5 1.5	30.51 .34	25.3 2.0
14.7	49.78+1.10	15.8 -0.1	3.58 +.33	7.5 -1.9	49.44 +.50	16.2 -2.0	30.85 +.34	23.3 -1.9
24.7	50.86 1.05	16.0 +0.5	3.91 .31	5.6 1.8	49.93 .47	18.6 2.5	31.18 .33	21.4 1.8
34.6	51.87+ .97	16.8 +1.1	4.22 +.30	3.9 -1.6	50.38 +.42	21.3 -3.0	31.50 +.31	19.7 -1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		γ Leonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h 10 ^m 56	[°] +62 ['] 20	^h 11 ^m 8	[°] +21 ['] 7	^h 11 ^m 13	[°] -14 ['] 10	^h 11 ^m 22	[°] +3 ['] 27
(Dec.30.7)	^s 56.01 +.58	["] 30.2 0.0	^s 14.96 +.34	["] 32.6 -1.5	^s 50.00 +.32	["] 50.9 -2.4	^s 16.21 +.32	["] 46.9 -2.0
Jan. 9.7	56.57 .54	30.5 +0.6	15.29 .31	31.3 1.2	50.30 .29	53.3 2.4	16.52 .30	44.9 1.9
19.6	57.08 .46	31.3 1.1	15.58 .28	30.2 0.9	50.58 .26	55.7 2.3	16.81 .27	43.1 1.7
29.6	57.52 .40	32.7 1.6	15.84 .24	29.5 0.5	50.82 .22	58.0 2.2	17.06 .23	41.5 1.5
Feb. 8.6	57.88 .31	34.5 2.0	16.06 .19	29.2 -0.2	51.02 .18	60.2 2.1	17.27 .19	40.2 1.2
	18.5 58.15 +.22	36.7 +2.3	16.23 +.14	29.2 +0.2	51.17 +.13	62.2 -1.9	17.44 +.14	39.1 -0.9
	28.5 58.31 .12	39.1 2.5	16.34 .09	29.5 0.5	51.28 .09	64.0 1.7	17.56 .10	38.4 0.6
Mar. 10.5	58.39 +.02	41.8 2.6	16.41 .05	30.1 0.7	51.35 .04	65.5 1.4	17.64 .08	37.8 0.4
20.5	58.37 -0.6	44.4 2.6	16.44 +.01	31.0 0.9	51.37 +.01	66.8 1.2	17.67 +.02	37.6 -0.1
30.4	58.27 .14	47.1 2.5	16.42 -0.3	31.9 1.0	51.36 -0.3	67.9 0.9	17.67 -0.1	37.5 +0.1
Apr. 9.4	58.10 -0.20	49.5 +2.3	16.38 -0.6	33.0 +1.1	51.31 -0.5	68.7 -0.7	17.64 -0.4	37.7 +0.2
19.4	57.86 .26	51.7 2.0	16.30 .09	34.1 1.1	51.25 .08	69.3 0.4	17.59 .07	38.0 0.4
29.4	57.58 .20	53.6 1.7	16.20 .10	35.1 1.0	51.16 .09	69.6 -0.2	17.51 .08	38.5 0.5
May 9.3	57.27 .22	55.0 1.3	16.10 .11	36.2 1.0	51.06 .10	69.7 0.0	17.42 .09	39.0 0.6
19.3	56.94 .23	56.0 0.8	15.98 .12	37.1 0.9	50.95 .11	69.6 +0.2	17.32 .10	39.6 0.6
	29.3 56.60 -0.23	56.6 +0.3	15.86 -1.2	37.9 +0.7	50.84 -1.1	69.3 +0.4	17.22 -1.0	40.2 +0.6
June 8.2	56.28 .22	56.6 -0.2	15.75 .11	38.5 0.5	50.73 .11	68.8 0.6	17.12 .10	40.8 0.6
18.2	55.97 .29	56.2 0.7	15.64 .10	39.0 0.4	50.62 .11	68.1 0.7	17.02 .10	41.5 0.6
28.2	55.70 .26	55.3 1.1	15.54 .09	39.3 +0.2	50.52 .10	67.3 0.9	16.93 .09	42.1 0.6
July 8.2	55.45 .22	53.9 1.5	15.46 .08	39.4 0.0	50.42 .09	66.3 1.0	16.84 .08	42.7 0.6
	18.1 55.25 -1.18	52.2 -1.9	15.38 -0.6	39.2 -0.2	50.34 -0.7	65.3 +1.1	16.77 -0.7	43.2 +0.5
28.1	55.10 .13	50.1 2.3	15.33 .04	38.9 0.4	50.28 .06	64.2 1.1	16.71 .05	43.6 0.4
Aug. 7.1	54.99 .08	47.6 2.6	15.30 -0.2	38.4 0.6	50.23 .04	63.1 1.1	16.67 .03	44.0 0.3
17.1	54.95 -0.2	44.9 2.9	15.29 .00	37.7 0.8	50.20 -0.1	61.9 1.1	16.65 -0.1	44.2 +0.1
27.0	54.96 +0.4	41.9 3.1	15.31 +0.3	36.8 1.0	50.20 +0.1	60.9 1.0	16.65 +0.1	44.3 0.0
Sept. 6.0	55.03 +.11	38.7 -3.2	15.36 +0.6	35.6 -1.3	50.23 +0.4	60.0 +0.8	16.67 +0.4	44.2 -0.2
16.0	55.18 .17	35.5 3.3	15.44 .10	34.3 1.5	50.29 .08	59.2 0.6	16.73 .08	43.9 0.4
25.9	55.38 .24	32.1 3.3	15.55 .13	32.7 1.6	50.39 .12	58.7 0.4	16.83 .11	43.3 0.7
Oct. 5.9	55.66 .31	28.8 3.3	15.70 .17	31.0 1.8	50.53 .16	58.5 +0.1	16.96 .15	42.5 0.9
15.9	56.01 .28	25.6 3.9	15.89 .21	29.0 2.0	50.71 .20	58.6 -0.3	17.13 .19	41.5 1.2
	25.9 56.42 +.44	22.5 -3.0	16.12 +.25	27.0 -2.1	50.93 +.24	59.0 -0.6	17.33 +.23	40.2 -1.4
Nov. 4.8	56.80 .20	19.7 2.7	16.39 .28	24.8 2.2	51.18 .27	59.8 1.0	17.58 .26	38.6 1.7
14.8	57.42 .25	17.2 2.3	16.69 .31	22.6 2.2	51.47 .30	61.0 1.3	17.85 .29	36.8 1.9
24.8	57.99 .29	15.0 1.9	17.02 .34	20.3 2.2	51.78 .32	62.5 1.7	18.15 .31	34.9 2.0
Dec. 4.8	58.59 .21	13.3 1.5	17.36 .35	18.2 2.1	52.11 .34	64.3 2.0	18.48 .33	32.8 2.1
	14.7 59.21 +.61	12.1 -0.9	17.72 +.35	16.1 -1.9	52.45 +.34	66.4 -2.2	18.82 +.34	30.6 -2.2
	24.7 59.82 .20	11.4 -0.4	18.07 .35	14.3 1.7	52.79 .33	68.6 2.3	19.16 .33	28.5 2.1
	34.7 60.41 +.27	11.3 +0.2	18.42 +.34	12.7 -1.4	53.11 +.31	71.0 -2.4	19.48 +.31	26.4 -2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		ν Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 11 24	+69° 55'	^h ^m 11 31	— 0° 12'	^h ^m 11 43	+15° 10'	^h ^m 11 48	+54° 17'
(Dec. 30.7)	^s 51.85 +.77	64.9 —0.1	^s 18.36 +.32	54.4 —2.1	^s 26.20 +.33	72.9 —1.9	^s 2.02 +.50	72.1 —0.9
Jan. 9.7	52.60 .79	65.1 +0.5	18.67 .30	56.5 2.0	26.53 .32	71.2 1.6	2.51 .46	71.5 —0.3
19.7	53.30 .66	65.9 1.1	18.96 .37	58.4 1.8	26.84 .29	69.7 1.3	2.97 .44	71.4 +0.9
29.6	53.91 .57	67.2 1.6	19.21 .94	60.2 1.6	27.11 .26	68.6 1.0	3.39 .30	71.9 0.6
Feb. 8.6	54.43 .46	69.1 2.1	19.43 .30	61.7 1.4	27.35 .22	67.8 0.6	3.75 .33	72.0 1.3
18.6	54.84 +.35	71.4 +2.5	19.60 +.15	63.0 —1.1	27.54 +.17	67.3 —0.3	4.05 +.26	74.5 +1.7
28.5	55.12 .22	74.0 2.7	19.73 .11	64.0 0.9	27.69 .13	67.2 0.0	4.27 .19	76.5 2.1
Mar. 10.5	55.28 +.10	76.8 2.9	19.82 .07	64.7 0.6	27.79 .08	67.4 +0.3	4.42 .12	78.7 2.3
20.5	55.31 —.03	79.7 2.9	19.87 +.03	65.2 0.4	27.85 +.04	67.9 0.6	4.50 +.04	81.1 2.5
30.5	55.23 .14	82.6 2.8	19.87 —.01	65.5 —0.2	27.87 .00	68.5 0.8	4.51 —.02	83.7 2.5
Apr. 9.4	55.04 —.24	85.4 +2.6	19.85 —.04	65.5 0.0	27.86 —.03	69.3 +0.9	4.46 —.06	86.2 +2.4
19.4	54.75 .32	87.8 2.3	19.80 .06	65.4 +0.2	27.82 .05	70.2 0.9	4.35 .13	88.6 2.3
29.4	54.39 .30	90.0 1.9	19.73 .06	65.1 0.3	27.75 .07	71.2 1.0	4.19 .17	90.8 2.1
May 9.3	53.97 .44	91.7 1.5	19.65 .09	64.7 0.4	27.67 .09	72.2 1.0	4.00 .20	92.7 1.7
19.3	53.52 .47	93.0 1.0	19.56 .10	64.2 0.5	27.57 .10	73.1 0.9	3.79 .22	94.2 1.4
29.3	53.04 —.48	93.8 +0.5	19.46 —.10	63.7 +0.6	27.47 —.10	74.0 +0.8	3.56 —.24	95.4 +1.0
June 8.3	52.56 .48	94.0 0.0	19.36 .10	63.1 0.6	27.36 .11	74.7 0.7	3.32 .24	96.1 0.5
18.2	52.09 .46	93.7 —0.5	19.26 .10	62.4 0.6	27.26 .10	75.4 0.6	3.08 .23	96.4 +0.1
28.2	51.64 .43	92.9 1.0	19.16 .09	61.8 0.7	27.15 .10	75.9 0.4	2.85 .22	96.3 —0.4
July 8.2	51.23 .38	91.6 1.5	19.07 .06	61.1 0.6	27.06 .09	76.2 0.3	2.63 .21	95.6 0.8
18.2	50.87 —.33	89.9 —2.0	19.00 —.07	60.5 +0.6	26.97 —.06	76.4 +0.1	2.43 —.19	94.6 —1.2
28.1	50.57 .27	87.7 2.4	18.93 .06	59.9 0.5	26.90 .07	76.4 —0.1	2.26 .16	93.1 1.6
Aug. 7.1	50.32 .20	85.1 2.7	18.88 .04	59.4 0.4	26.84 .05	76.2 0.3	2.12 .19	91.3 2.0
17.1	50.16 .13	82.2 3.0	18.85 —.02	59.0 0.3	26.79 .03	75.8 0.5	2.01 .09	89.1 2.4
27.0	50.07 —.05	79.1 3.3	18.84 +.01	58.7 +0.2	26.77 —.01	75.2 0.7	1.94 —.04	86.6 2.7
Sept. 6.0	50.06 +.04	75.7 —3.4	18.86 +.03	58.7 0.0	26.78 +.02	74.4 —0.9	1.92 .00	83.7 —2.9
16.0	50.14 .13	72.2 3.6	18.91 .07	58.8 —0.2	26.82 .05	73.4 1.1	1.95 +.05	80.7 3.1
26.0	50.32 .22	68.6 3.6	18.99 .10	59.1 0.4	26.89 .09	72.1 1.4	2.03 .11	77.5 3.2
Oct. 5.9	50.59 .22	64.9 3.6	19.11 .14	59.7 0.7	27.00 .13	70.6 1.6	2.17 .17	74.2 3.3
15.9	50.95 .41	61.4 3.5	19.27 .18	60.5 1.0	27.16 .17	68.9 1.8	2.37 .23	70.9 3.3
25.9	51.41 +.50	58.0 —3.3	19.47 +.22	61.6 —1.3	27.35 +.21	67.0 —2.0	2.63 +.29	67.6 —3.3
Nov. 4.9	51.96 .59	54.9 3.0	19.71 .25	63.0 1.5	27.53 .25	65.0 2.1	2.95 .35	64.3 3.1
14.8	52.58 .66	52.1 2.6	19.98 .29	64.7 1.8	27.85 .28	62.8 2.3	3.33 .40	61.3 2.9
24.8	53.28 .72	49.6 2.2	20.28 .31	66.6 2.0	28.15 .31	60.5 2.3	3.75 .44	58.5 2.6
Dec. 4.8	54.03 .76	47.7 1.7	20.60 .32	68.6 2.1	28.47 .33	58.2 2.2	4.22 .48	56.1 2.2
14.7	54.81 +.79	46.3 —1.1	20.94 +.33	70.7 —2.2	28.81 +.34	56.0 —2.1	4.71 +.50	54.1 —1.8
24.7	55.60 .78	45.4 —0.5	21.27 .33	72.9 2.2	29.16 .34	53.9 2.0	5.22 .51	52.5 1.3
34.7	56.37 +.76	45.2 +0.1	21.60 +.36	75.1 —2.1	29.50 +.33	52.0 —1.8	5.72 +.50	51.6 —0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Virginis.		4 Draconis (H.)		γ Corvi.		β Chamaeleontis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h ^m 11 59	+ 9° 20'	^h ^m 12 6	+78° 13'	^h ^m 12 10	-16° 55'	^h ^m 12 11	-78° 41'
(Dec.30.7)	^s 35.52 +.33	40.2 -2.1	^s 62.42+1.23	25.6 -0.5	^s 8.11 +.34	40.9 -2.2	^s 54.17+1.90	38.0 -1.4
Jan. 9.7	35.85 .32	38.2 1.8	63.64 1.19	25.4 +0.2	8.45 .32	43.2 2.3	55.34 1.12	39.8 2.0
19.7	36.16 .29	36.5 1.6	64.80 1.12	25.9 0.8	8.76 .30	45.5 2.3	56.42 1.02	42.1 2.5
29.6	36.44 .26	35.1 1.3	65.88 1.01	27.0 1.4	9.04 .27	47.9 2.3	57.39 .90	44.8 3.0
Feb. 8.6	36.68 .22	34.0 1.0	66.83 .87	28.7 1.9	9.29 .23	50.1 2.2	58.23 .76	48.0 3.3
18.6	36.89 +.18	33.2 -0.6	67.62 +.60	30.9 +2.4	9.50 +.19	52.2 -2.0	58.90 +.59	51.5 -3.6
28.6	37.04 .14	32.7 -0.3	68.23 .51	33.5 2.7	9.66 .15	54.2 1.8	59.42 .43	55.2 3.7
Mar. 10.5	37.16 .10	32.5 0.0	68.65 .31	36.3 2.9	9.79 .10	55.9 1.6	59.76 .26	59.0 3.8
20.5	37.24 .06	32.6 +0.2	68.86 +.11	39.3 3.1	9.87 .07	57.4 1.4	59.93 +.09	62.8 3.8
30.5	37.28 +.02	32.9 0.4	68.86 -0.09	42.4 3.0	9.92 +.03	58.7 1.2	59.94 -0.08	66.6 3.7
Apr. 9.5	37.28 -0.01	33.4 +0.6	69.67 -0.28	45.4 +2.9	9.93 .00	59.7 -0.9	59.78 -0.23	70.3 -3.6
19.4	37.25 .04	34.0 0.7	68.31 .44	48.2 2.6	9.92 -0.03	60.5 0.7	59.47 .38	73.8 3.3
29.4	37.20 .06	34.8 0.8	67.79 .58	50.7 2.3	9.88 .05	61.1 0.5	59.02 .52	77.0 3.0
May 9.4	37.14 .07	35.6 0.8	67.14 .70	52.9 1.9	9.82 .07	61.5 0.3	58.43 .64	79.8 2.7
19.3	37.06 .09	36.4 0.8	66.38 .79	54.5 1.4	9.74 .08	61.6 -0.1	57.73 .75	82.3 2.2
29.3	36.96 -0.09	37.2 +0.8	65.56 -0.85	55.7 +0.9	9.65 -0.09	61.6 +0.1	56.94 -0.84	84.3 -1.8
June 6.3	36.87 .10	38.0 0.7	64.68 .88	56.3 +0.3	9.55 .10	61.4 0.3	56.06 .90	85.9 1.3
18.3	36.77 .10	38.7 0.6	63.79 .89	56.4 -0.2	9.45 .11	60.9 0.5	55.12 .95	86.9 0.7
28.2	36.67 .10	39.2 0.5	62.91 .87	55.9 0.8	9.34 .11	60.4 0.6	54.15 .97	87.4 -0.2
July 8.2	36.57 .10	39.7 0.4	62.06 .82	54.9 1.3	9.23 .11	59.6 0.8	53.17 .97	87.3 +0.3
18.2	36.48 -0.09	40.1 +0.3	61.26 -0.76	53.3 -1.8	9.12 -0.10	58.8 +0.9	52.21 -0.24	86.6 +0.9
28.2	36.40 .09	40.3 +0.2	60.54 .68	51.3 2.2	9.02 .09	57.9 1.0	51.30 .88	85.5 1.4
Aug. 7.1	36.33 .06	40.4 0.0	59.91 .58	48.9 2.7	8.93 .08	56.8 1.0	50.46 .78	83.8 1.9
17.1	36.27 .04	40.3 -0.2	59.38 .47	46.0 3.0	8.86 .06	55.8 1.0	49.73 .66	81.7 2.3
27.1	36.24 -0.02	40.1 0.4	58.98 .34	42.8 3.3	8.81 .04	54.8 1.0	49.14 .51	79.3 2.6
Sept. 6.0	36.23 +.01	39.6 -0.6	58.71 -0.20	39.4 -3.5	8.78 -0.01	53.8 +0.9	48.71 -0.34	76.5 +2.8
16.0	36.25 .04	38.9 0.8	58.58 -0.05	35.7 3.7	8.78 +0.02	53.0 0.7	48.46 -0.15	73.6 3.0
26.0	36.31 .07	38.0 1.0	58.61 +0.10	31.9 3.8	8.83 .06	52.4 0.5	48.40 +0.05	70.5 3.0
Oct. 6.0	36.40 .11	36.8 1.3	58.79 .27	28.1 3.8	8.91 .10	51.9 +0.3	48.56 .26	67.6 2.9
15.9	36.54 .15	35.4 1.5	59.14 .43	24.3 3.8	9.03 .15	51.8 0.0	48.93 .47	64.8 2.7
25.9	36.71 +.19	33.8 -1.7	59.65 +.59	20.6 -3.8	9.20 +.19	52.0 -0.3	49.50 +.67	62.2 +2.3
Nov. 4.9	36.93 .23	32.0 1.9	60.32 .75	17.1 3.4	9.42 .23	52.5 0.7	50.26 .84	60.1 1.9
14.9	37.18 .27	29.9 2.1	61.15 .89	13.9 3.0	9.68 .27	53.4 1.0	51.19 .99	58.4 1.4
24.8	37.47 .30	27.8 2.2	62.11 1.02	11.0 2.6	9.97 .30	54.6 1.4	52.25 1.11	57.3 0.8
Dec. 4.8	37.78 .32	25.5 2.2	63.19 1.12	8.7 2.1	10.29 .33	56.1 1.7	53.40 1.19	56.8 +0.2
14.8	38.12 +.34	23.3 -2.2	64.34+1.19	6.8 -1.5	10.62 +.34	58.0 -1.9	54.62+1.22	56.9 -0.5
24.7	38.46 .34	21.1 2.1	65.56 1.22	5.6 0.9	10.97 .34	60.0 2.1	55.85 1.22	57.7 1.1
34.7	38.80 +.33	19.0 -2.0	66.79+1.23	5.0 -0.3	11.31 +.33	62.3 -2.3	57.06+1.18	59.1 -1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α^1 Crucis.		β Cervi.		κ Draconis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h ^m 12 14	[°] ['] — 0 3	^h ^m 12 20	[°] ['] — 62 28	^h ^m 12 28	[°] ['] — 22 47	^h ^m 12 28	[°] ['] + 70 23
(Dec. 30.7)	^s 15.81 +.33	14.6 —2.1	^s 28.24 +.55	57.6 —1.7	^s 35.57 +.35	4.9 —2.1	^s 46.34 +.78	27.5 —1.0
Jan. 9.7	16.13 .32	16.7 2.0	28.80 .55	59.5 2.2	35.92 .34	7.1 2.3	47.12 .77	26.8 —0.4
19.7	16.44 .30	18.7 1.9	29.33 .51	61.9 2.6	36.25 .39	9.5 2.4	47.88 .74	26.8 +0.3
29.7	16.72 .27	20.5 1.7	29.82 .46	64.7 3.0	36.55 .39	11.9 2.4	48.60 .68	27.4 0.9
Feb. 8.6	16.97 .23	22.0 1.4	30.24 .39	67.9 3.2	36.82 .35	14.3 2.3	49.24 .60	28.6 1.5
18.6	17.18 +.19	23.4 —1.2	30.59 +.31	71.2 —3.4	37.05 +.31	16.6 —2.2	49.79 +.50	30.3 +2.0
28.6	17.35 .15	24.4 0.9	30.87 .34	74.7 3.5	37.23 .17	18.8 2.1	50.24 .39	32.6 2.4
Mar. 10.5	17.48 .11	25.2 0.6	31.07 .16	78.3 3.5	37.38 .13	20.8 1.9	50.57 .27	35.2 2.7
20.5	17.57 .07	25.7 0.4	31.20 .09	81.8 3.5	37.49 .09	22.7 1.7	50.77 .15	38.0 2.9
30.5	17.63 +.04	25.9 —0.1	31.25 +.02	85.3 3.4	37.55 .05	24.3 1.5	50.86 +.03	40.9 3.0
Apr. 9.5	17.64 +.01	26.0 +0.1	31.24 —.04	88.5 —3.2	37.59 +.02	25.7 —1.3	50.83 —.09	43.9 +3.0
19.4	17.63 —.02	25.8 0.2	31.17 .10	91.6 2.9	37.59 —.01	26.8 1.0	50.68 .19	46.8 2.6
29.4	17.60 .04	25.5 0.4	31.03 .16	94.3 2.6	37.56 .04	27.8 0.8	50.44 .28	49.5 2.5
May 9.4	17.55 .06	25.1 0.5	30.85 .21	96.8 2.2	37.51 .06	28.5 0.6	50.12 .26	51.8 2.1
19.4	17.48 .08	24.6 0.5	30.62 .25	98.8 1.8	37.45 .08	28.9 0.3	49.73 .22	53.8 1.7
29.3	17.39 —.09	24.0 +0.6	30.35 —.29	100.4 —1.4	37.36 —.09	29.1 —0.1	49.28 —.46	55.3 +1.3
June 8.3	17.31 .09	23.4 0.6	30.04 .32	101.6 0.9	37.26 .10	29.2 +0.1	48.80 .49	56.3 0.8
18.3	17.21 .10	22.8 0.6	29.72 .34	102.3 —0.5	37.16 .11	28.9 0.3	48.31 .50	56.8 +0.9
28.2	17.11 .10	22.2 0.6	29.37 .35	102.6 0.0	37.04 .12	28.5 0.5	47.80 .50	56.8 —0.3
July 8.2	17.01 .10	21.5 0.6	29.02 .35	102.3 +0.5	36.92 .12	27.9 0.7	47.30 .49	56.2 0.8
18.2	16.92 —.09	21.0 +0.5	28.67 —.34	101.5 +1.0	36.80 —.12	27.1 +0.9	46.83 —.46	55.1 —1.3
28.2	16.83 .06	20.4 0.5	28.34 .32	100.3 1.4	36.69 .11	26.1 1.0	46.38 .42	53.5 1.8
Aug. 7.1	16.75 .07	20.0 0.4	28.03 .29	98.7 1.8	36.58 .10	25.1 1.1	45.98 .37	51.5 2.3
17.1	16.69 .05	19.7 0.3	27.76 .25	96.7 2.2	36.48 .08	23.9 1.2	45.64 .31	49.0 2.7
27.1	16.64 .03	19.5 +0.1	27.53 .19	94.4 2.4	36.41 .06	22.7 1.2	45.36 .25	46.2 3.0
Sept. 6.1	16.62 —.01	19.4 0.0	27.38 —.12	91.8 +2.6	36.36 —.03	21.5 +1.1	45.15 —.17	43.0 —3.3
16.0	16.62 +.02	19.6 —0.2	27.29 —.04	89.2 2.7	36.35 .00	20.4 1.0	45.03 —.08	39.6 3.5
26.0	16.67 .06	19.9 0.5	27.29 +.04	86.5 2.6	36.37 +.04	19.4 0.8	44.99 +.01	36.0 3.7
Oct. 6.0	16.74 .10	20.5 0.7	27.37 .13	83.9 2.5	36.43 .09	18.7 0.6	45.05 .11	32.2 3.8
15.9	16.86 .14	21.4 1.0	27.55 .29	81.5 2.3	36.54 .13	18.2 +0.3	45.22 .22	28.4 3.8
25.9	17.02 +.18	22.5 —1.3	27.82 +.31	79.4 +1.9	36.70 +.18	18.0 0.0	45.49 +.22	24.6 —3.7
Nov. 4.9	17.22 .22	23.9 1.5	28.17 .39	77.7 1.5	36.91 .23	18.1 —0.3	45.87 .43	21.0 3.5
14.9	17.47 .26	25.5 1.8	28.60 .46	76.4 1.0	37.16 .27	18.6 0.7	46.35 .52	17.5 3.3
24.8	17.75 .29	27.4 2.0	29.10 .52	75.7 +0.4	37.45 .30	19.5 1.1	46.92 .61	14.4 3.0
Dec. 4.8	18.05 .32	29.4 2.1	29.65 .56	75.6 —0.2	37.77 .33	20.8 1.4	47.57 .69	11.6 2.5
14.8	18.38 +.33	31.6 —2.2	30.22 +.56	76.1 —0.8	38.11 +.34	22.4 —1.7	48.29 +.74	9.4 —2.0
24.8	18.72 .33	33.8 2.2	30.81 .59	77.2 1.4	38.46 .35	24.3 2.0	49.05 .77	7.7 1.4
34.7	19.05 +.32	35.9 —2.1	31.40 +.58	78.9 —1.9	38.82 +.34	26.4 —2.2	49.84 +.78	6.6 —0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32 ^a Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis. (Spica.)	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h ^m 12 48	+84° 0'	^h ^m 12 50	+38° 54'	^h ^m 13 4	— 4° 56'	^h ^m 13 19	—10° 35'
(Dec. 30.8)	18.14+2.22	25.0 —0.9	51.86 +.39	37.7 —1.9	14.05 +.33	58.9 —2.1	22.57 +.33	4.5 —2.0
Jan. 9.7	20.40 2.25	24.4 —0.3	52.25 .39	36.1 1.4	14.39 .33	61.0 2.1	22.90 .33	6.6 2.1
19.7	22.64 2.20	24.5 +0.4	52.64 .38	34.9 0.9	14.71 .31	63.1 2.0	23.23 .32	8.6 2.0
29.7	24.79 2.06	25.2 1.0	53.01 .35	34.2 —0.4	15.02 .29	65.0 1.9	23.55 .30	10.6 2.0
Feb. 8.6	26.76 1.85	26.5 1.6	53.34 .31	34.1 +0.1	15.30 .26	66.8 1.6	23.84 .27	12.5 1.8
18.6	28.49+1.58	28.4 +2.1	53.63 +.27	34.5 +0.6	15.55 +.23	68.3 —1.4	24.10 +.24	14.3 —1.6
28.6	29.92 1.25	30.8 2.5	53.88 .22	35.4 1.1	15.76 .20	69.6 1.2	24.32 .21	15.8 1.4
Mar. 10.6	31.00 .89	33.5 2.8	54.08 .17	36.7 1.5	15.94 .16	70.7 0.9	24.52 .17	17.1 1.2
20.5	31.70 .51	36.5 3.0	54.23 .12	38.3 1.8	16.08 .12	71.5 0.7	24.67 .14	18.2 1.0
30.5	32.02 +.11	39.6 3.1	54.32 .07	40.2 2.0	16.18 .09	72.1 0.4	24.79 .10	19.1 0.8
Apr. 9.5	31.93 —.26	42.7 +3.0	54.37 +.03	42.3 +2.1	16.25 +.05	72.4 —0.2	24.88 +.07	19.8 —0.6
19.5	31.49 .62	45.7 2.9	54.38 —.01	44.4 2.1	16.29 +.02	72.5 0.0	24.93 .04	20.2 0.4
29.4	30.69 .95	48.4 2.6	54.34 .05	46.6 2.1	16.30 .00	72.4 +0.1	24.96 +.01	20.5 —0.2
May 9.4	29.58 1.24	50.9 2.2	54.27 .08	48.6 2.0	16.29 —.02	72.2 0.3	24.96 —.01	20.6 0.0
19.4	28.21 1.47	52.9 1.8	54.18 .11	50.5 1.8	16.26 .04	71.9 0.4	24.94 .03	20.5 +0.1
29.3	26.64—1.66	54.4 +1.3	54.03 —.13	52.2 +1.5	16.20 —.06	71.5 +0.5	24.90 —.05	20.3 +0.2
June 8.3	24.90 1.78	55.4 0.7	53.93 .14	53.5 1.2	16.14 .08	71.0 0.5	24.84 .07	20.1 0.3
18.3	23.07 1.86	55.9 +0.2	53.78 .15	54.5 0.9	16.05 .09	70.5 0.5	24.76 .08	19.7 0.4
28.3	21.19 1.88	55.8 —0.4	53.62 .16	55.2 0.5	15.96 .10	69.9 0.6	24.67 .10	19.2 0.5
July 8.2	19.30 1.86	55.2 0.9	53.46 .16	55.5 +0.1	15.86 .10	69.3 0.6	24.57 .11	18.7 0.5
18.2	17.47—1.79	54.0 —1.5	53.30 —.16	55.4 —0.3	15.75 —.11	68.7 +0.6	24.46 —.11	18.2 +0.6
28.2	15.74 1.67	52.3 1.9	53.14 .15	55.0 0.6	15.64 .11	68.2 0.5	24.35 .11	17.6 0.6
Aug. 7.2	14.13 1.52	50.1 2.4	53.00 .14	54.1 1.0	15.54 .10	67.6 0.5	24.23 .11	17.0 0.6
17.1	12.70 1.33	47.5 2.8	52.87 .12	52.9 1.4	15.44 .09	67.2 0.4	24.12 .10	16.4 0.6
27.1	11.47 1.11	44.5 3.2	52.76 .10	51.4 1.7	15.35 .07	66.8 0.3	24.02 .09	15.8 0.5
Sept. 6.1	10.48 —.86	41.2 —3.5	52.67 —.07	49.5 —2.1	15.29 —.05	66.5 +0.2	23.94 —.07	15.3 +0.4
16.0	9.75 .59	37.6 3.7	52.62 —.03	47.3 2.3	15.24 —.02	66.4 0.0	23.89 —.04	14.9 0.3
26.0	9.30 —.29	33.8 3.8	52.61 +.01	44.8 2.6	15.24 +.01	66.5 —0.2	23.86 .00	14.7 +0.1
Oct. 6.0	9.16 +.01	29.9 3.9	52.64 .06	42.0 2.8	15.26 .05	66.8 0.4	23.87 +.03	14.7 —0.1
16.0	9.33 .34	26.0 3.9	52.72 .11	39.1 3.0	15.33 .09	67.4 0.7	23.93 .08	14.8 0.3
25.9	9.84 +.67	22.2 —3.8	52.85 +.16	36.0 —3.1	15.45 +.14	68.2 —0.9	24.03 +.12	15.3 —0.6
Nov. 4.9	10.67 .99	18.5 3.6	53.04 .21	32.8 3.2	15.61 .16	69.3 1.2	24.18 .17	16.0 0.9
14.9	11.82 1.30	15.0 3.3	53.27 .26	29.7 3.1	15.81 .22	70.6 1.5	24.38 .22	17.0 1.1
24.9	13.27 1.59	11.8 2.9	53.56 .31	26.6 3.0	16.06 .26	72.2 1.7	24.61 .26	18.3 1.4
Dec. 4.8	14.99 1.84	9.1 2.5	53.89 .35	23.6 2.8	16.34 .30	74.0 1.9	24.89 .29	19.8 1.6
14.8	16.94+2.03	6.3 —2.0	54.25 +.37	20.9 —2.5	16.65 +.32	76.0 —2.0	25.20 +.32	21.6 —1.8
24.8	19.06 2.17	5.2 1.4	54.63 .39	18.5 2.2	16.98 .33	78.1 2.1	25.53 .33	23.5 2.0
34.8	21.28+2.25	4.1 —0.7	55.03 +.40	16.5 —1.7	17.32 +.34	80.2 —2.2	25.86 +.34	25.5 —2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 13 29	^m — 0 1'	^h 13 43	^m +49° 51'	^h 13 49	^m +18° 56'	^h 13 56	^m —59° 50'
(Dec.30.8)	3.94 +.33	54.8 —2.2	10.95 +.43	35.0 —2.3	25.42 +.33	56.3 —2.4	1.42 +.36	9.2 —0.5
Jan. 9.8	4.27 .33	56.9 2.1	11.39 .44	33.0 1.8	25.75 .34	54.1 2.1	1.99 .56	9.9 1.0
19.7	4.60 .33	58.9 1.9	11.84 .44	31.5 1.2	26.09 .33	52.1 1.8	2.55 .56	11.2 1.5
29.7	4.91 .30	60.8 1.7	12.27 .43	30.6 —0.6	26.42 .33	50.5 1.4	3.10 .54	12.9 1.9
Feb. 8.7	5.20 .28	62.4 1.5	12.60 .40	30.3 0.0	26.74 .30	49.4 1.0	3.62 .50	15.0 2.3
18.7	5.47 +.25	63.8 —1.2	13.07 +.36	30.7 +0.6	27.02 +.27	48.6 —0.5	4.10 +.46	17.5 —2.6
28.6	5.70 .21	64.8 0.9	13.41 .39	31.6 1.9	27.28 .24	48.3 —0.1	4.54 .41	20.2 2.8
Mar. 10.6	5.90 .18	65.6 0.6	13.70 .36	33.0 1.7	27.50 .20	48.4 +0.3	4.92 .36	23.0 2.9
20.6	6.06 .14	66.1 0.4	13.94 .31	34.9 2.1	27.69 .17	48.9 0.6	5.24 .29	26.0 3.0
30.5	6.19 .11	66.4 —0.1	14.11 .15	37.1 2.4	27.84 .13	49.7 0.9	5.50 .23	29.1 3.1
Apr. 9.5	6.28 +.08	66.4 +0.1	14.23 +.09	39.6 +2.6	27.95 +.10	50.8 +1.2	5.71 +.17	32.2 —3.0
19.5	6.34 .05	66.2 0.3	14.30 +.04	42.2 2.6	28.03 .06	52.1 1.4	5.85 .11	35.2 2.9
29.5	6.38 +.02	65.8 0.4	14.31 —.01	44.9 2.6	28.07 +.03	53.5 1.5	5.93 +.06	38.1 2.8
May 9.4	6.38 .00	65.3 0.5	14.27 .06	47.5 2.5	28.09 .00	55.0 1.5	5.95 .00	40.8 2.6
19.4	6.37 —.03	64.7 0.6	14.19 .10	49.9 2.3	28.08 —.02	56.5 1.5	5.92 —.06	43.3 2.4
29.4	6.33 —.05	64.1 +0.7	14.07 —.14	52.1 +2.0	28.04 —.05	57.9 +1.4	5.83 —.11	45.6 —2.1
June 8.4	6.28 .06	63.4 0.7	13.91 .17	54.0 1.7	27.98 .07	59.3 1.3	5.69 .16	47.5 1.8
18.3	6.21 .08	62.7 0.7	13.73 .19	55.5 1.3	27.91 .09	60.5 1.1	5.51 .21	49.1 1.4
28.3	6.12 .09	62.1 0.6	13.52 .21	56.7 0.9	27.81 .10	61.5 0.9	5.27 .25	50.3 1.0
July 8.3	6.02 .10	61.5 0.6	13.30 .23	57.4 +0.5	27.70 .12	62.3 0.7	5.01 .28	51.0 0.5
18.2	5.91 —.11	60.9 +0.5	13.07 —.22	57.6 0.0	27.58 —.13	62.8 +0.4	4.71 —.31	51.4 —0.1
28.2	5.80 .11	60.4 0.4	12.84 .23	57.3 —0.5	27.45 .13	63.1 +0.2	4.39 .32	51.3 +0.3
Aug. 7.2	5.69 .11	60.0 0.4	12.60 .23	56.6 0.9	27.32 .13	63.2 —0.1	4.07 .33	50.7 0.8
17.2	5.57 .10	59.7 0.2	12.38 .22	55.5 1.4	27.19 .13	63.0 0.4	3.75 .31	49.7 1.2
27.1	5.47 .09	59.6 +0.1	12.17 .20	53.0 1.8	27.06 .12	62.5 0.6	3.45 .28	48.3 1.6
Sept. 6.1	5.39 —.07	59.6 —0.1	11.99 —.17	51.9 —2.2	26.95 —.10	61.7 —0.9	3.18 —.24	46.6 +1.9
16.1	5.32 .05	59.7 0.3	11.83 .13	49.5 2.6	26.77 .07	60.6 1.2	2.96 .19	44.6 2.1
26.1	5.29 —.02	60.1 0.5	11.72 .09	46.7 2.9	26.61 —.04	59.2 1.5	2.80 .12	42.3 2.3
Oct. 6.0	5.29 +.02	60.7 0.7	11.66 —.04	43.7 3.2	26.78 .00	57.6 1.8	2.71 —.06	40.0 2.4
16.0	5.34 .06	61.5 0.9	11.65 +.02	40.4 3.4	26.80 +.04	55.7 2.0	2.71 +.04	37.6 2.3
26.0	5.42 +.11	62.5 —1.2	11.70 +.09	36.9 —3.5	26.86 +.06	53.5 —2.3	2.79 +.13	35.3 +2.2
Nov. 5.0	5.56 .16	63.9 1.4	11.82 .15	33.3 3.6	26.97 .13	51.2 2.5	2.97 .22	33.2 2.0
14.9	5.74 .20	65.4 1.7	12.01 .22	29.7 3.6	27.12 .18	48.6 2.6	3.23 .31	31.4 1.7
24.9	5.96 .24	67.2 1.9	12.25 .26	26.2 3.5	27.33 .23	46.0 2.7	3.58 .39	29.9 1.3
Dec. 4.9	6.23 .28	69.2 2.0	12.56 .33	22.8 3.3	27.58 .27	43.3 2.7	4.01 .45	28.9 0.8
14.8	6.52 +.31	71.3 —2.1	12.92 +.37	19.6 —3.0	27.86 +.30	40.6 —2.6	4.49 +.51	28.3 +0.3
24.8	6.84 .22	73.4 2.2	13.32 .41	16.8 2.6	28.18 .33	38.0 2.5	5.02 .54	28.3 —0.2
34.8	7.17 +.23	75.6 —2.1	13.75 +.44	14.4 —2.1	28.51 +.34	35.6 —2.3	5.58 +.57	28.8 —0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Draconis.		<i>a</i> Bootis. (<i>Arcturus</i> .)		<i>θ</i> Bootis.		<i>ρ</i> Bootis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 14	^m 1	^h 14	^m 10	^h 14	^m 21	^h 14	^m 27
		+64° 53'		+19° 44'		+52° 21'		+30° 50'
(Dec. 30.8)	^s 22.92	+58	^s 37.12	+32	^s 25.45	+42	^s 3.80	+33
Jan. 9.8	23.52	.61	37.45	.33	25.88	.44	4.14	.35
19.8	24.13	.61	37.79	.33	26.33	.45	4.49	.35
29.7	24.74	.61	38.12	.32	26.79	.45	4.85	.35
Feb. 8.7	25.34	.58	38.43	.31	27.23	.43	5.19	.33
18.7	25.90	+53	38.73	+28	27.65	+40	5.51	+31
28.7	26.41	.47	39.00	.25	28.04	.36	5.82	.28
Mar. 10.6	26.84	.40	39.24	.22	28.38	.32	6.08	.25
20.6	27.20	.31	39.44	.19	28.67	.26	6.31	.21
30.6	27.47	.23	39.61	.15	28.91	.21	6.51	.17
Apr. 9.5	27.66	+14	39.74	+11	29.08	+15	6.66	+14
19.5	27.75	+05	39.83	.08	29.20	.09	6.78	.10
29.5	27.76	-.03	39.90	.05	29.26	+03	6.86	.06
May 9.5	27.68	.11	39.93	+02	29.27	-.02	6.90	+03
19.4	27.53	.18	39.94	-.01	29.23	.07	6.91	-.01
29.4	27.32	-.25	39.92	-.03	29.13	-.11	6.89	-.04
June 8.4	27.04	.30	39.87	.06	29.00	.15	6.83	.07
18.3	26.72	.34	39.80	.08	28.82	.19	6.75	.09
28.3	26.36	.38	39.71	.10	28.62	.22	6.65	.12
July 8.3	25.96	.40	39.60	.12	28.38	.24	6.52	.14
18.3	25.55	-.42	39.48	-.13	28.13	-.26	6.38	-.15
28.2	25.13	.42	39.34	.14	27.86	.27	6.22	.16
Aug. 7.2	24.71	.41	39.20	.14	27.59	.27	6.05	.17
17.2	24.31	.39	39.05	.14	27.32	.27	5.88	.17
27.2	23.93	.36	38.91	.13	27.05	.26	5.71	.16
Sept. 6.1	23.58	-.32	38.79	-.12	26.81	-.23	5.55	-.15
16.1	23.28	.37	38.68	.10	26.59	.20	5.42	.13
26.1	23.03	.31	38.59	.07	26.41	.16	5.30	.10
Oct. 6.0	22.86	.14	38.55	-.03	26.28	.11	5.22	.06
16.0	22.76	-.05	38.53	+01	26.20	-.05	5.18	-.02
26.0	22.75	+04	38.57	+06	26.18	+02	5.19	+03
Nov. 5.0	22.83	.13	38.65	.11	26.23	.08	5.25	.09
14.9	23.01	.22	38.79	.16	26.35	.15	5.37	.14
24.9	23.28	.22	38.97	.21	26.54	.22	5.54	.19
Dec. 4.9	23.65	.40	39.20	.25	26.80	.29	5.76	.24
14.9	24.09	+48	39.47	+28	27.12	+35	6.02	+28
24.8	24.60	.54	39.77	.31	27.49	.39	6.32	.32
34.8	25.16	+59	40.09	+33	27.91	+43	6.65	+34

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α^1 Centauri.		ϵ Bootis.		α^3 Libræ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 14 ^m 27	+76° 10'	^h 14 ^m 32	-60° 22'	^h 14 ^m 40	+27° 31'	^h 14 ^m 44	-15° 34'
(Dec. 30.8)	^s 43.02 +.88	53.8 -2.5	^s 6.29 +.54	42.0 0.0	^s 9.36 +.32	73.7 -2.6	^s 45.72 +.32	54.7 -1.6
Jan. 9.8	43.94 .95	51.7 1.8	6.84 .56	42.3 -0.5	9.69 .34	71.2 2.3	46.04 .33	56.3 1.7
19.8	44.92 .99	50.1 1.3	7.41 .56	43.0 1.0	10.03 .34	69.1 1.9	46.38 .33	58.0 1.7
29.7	45.92 1.00	49.3 -0.5	7.97 .55	44.2 1.4	10.37 .34	67.3 1.5	46.71 .33	59.7 1.7
Feb. 8.7	46.92 .98	49.0 +0.1	8.51 .53	45.8 1.6	10.71 .33	66.1 1.0	47.04 .32	61.4 1.6
18.7	47.89 +.93	49.5 +0.8	9.03 +.50	47.8 -2.1	11.03 +.31	65.3 -0.5	47.35 +.30	63.0 -1.5
28.7	48.78 .84	50.7 1.4	9.51 .46	50.1 2.4	11.33 .28	65.1 0.0	47.63 .27	64.4 1.4
Mar. 10.6	49.57 .73	52.4 1.9	9.94 .41	52.6 2.6	11.60 .25	65.3 +0.5	47.90 .25	65.8 1.2
20.6	50.24 .60	54.5 2.4	10.32 .36	55.3 2.8	11.84 .22	66.0 0.9	48.13 .22	66.9 1.0
30.6	50.76 .45	57.1 2.7	10.65 .30	58.1 2.9	12.04 .18	67.1 1.3	48.34 .19	67.8 0.9
Apr. 9.5	51.13 +.29	60.0 +3.0	10.91 +.34	61.0 -2.9	12.20 +.15	68.6 +1.6	48.51 +.16	68.6 -0.7
19.5	51.34 +.13	63.1 3.1	11.12 .18	63.9 2.9	12.33 .11	70.4 1.8	48.66 .13	69.2 0.5
29.5	51.39 -.03	66.2 3.1	11.27 .12	66.7 2.8	12.43 .08	72.3 2.0	48.77 .10	69.7 0.4
May 9.5	51.28 .19	69.2 3.0	11.36 +.06	69.5 2.7	12.49 .04	74.3 2.0	48.86 .07	70.0 0.2
19.4	51.02 .33	72.1 2.8	11.39 .00	72.1 2.5	12.51 +.01	76.3 2.0	48.92 .04	70.2 -0.1
29.4	50.63 -.45	74.8 +2.5	11.35 -.06	74.5 -2.3	12.51 -.02	78.3 +1.9	48.95 +.02	70.3 0.0
June 8.4	50.12 .57	77.0 2.1	11.26 .12	76.6 2.0	12.47 .05	80.2 1.8	48.95 -.01	70.2 +0.1
18.4	49.49 .67	78.9 1.6	11.11 .18	78.5 1.7	12.41 .08	81.9 1.6	48.93 .04	70.1 0.1
28.3	48.79 .74	80.3 1.1	10.90 .23	80.0 1.3	12.32 .10	83.3 1.3	48.88 .06	70.0 0.2
July 8.3	48.02 .79	81.1 0.6	10.65 .27	81.1 0.9	12.21 .12	84.5 1.0	48.80 .09	69.7 0.3
18.3	47.20 -.83	81.5 +0.1	10.36 -.31	81.8 -0.5	12.07 -.14	85.4 +0.7	48.70 -.11	69.4 +0.3
28.3	46.36 .86	81.4 -0.4	10.04 .33	82.1 -0.1	11.92 .16	86.0 +0.4	48.58 .13	69.1 0.4
Aug. 7.2	45.51 .84	80.6 1.0	9.69 .35	82.0 +0.4	11.76 .16	86.2 0.0	48.45 .14	68.7 0.4
17.2	44.68 .82	79.4 1.5	9.34 .35	81.4 0.8	11.59 .17	86.1 -0.3	48.31 .14	68.2 0.5
27.2	43.87 .78	77.7 2.0	9.00 .33	80.4 1.2	11.43 .16	85.6 0.7	48.16 .14	67.7 0.5
Sept. 6.1	43.13 -.71	75.5 -2.4	8.68 -.30	79.0 +1.6	11.27 -.15	84.8 -1.0	48.02 -.13	67.3 +0.4
16.1	42.45 .83	72.9 2.8	8.40 .26	77.3 1.9	11.13 .13	83.6 1.4	47.90 .11	66.9 0.4
26.1	41.87 .83	69.8 3.2	8.17 .20	75.2 2.1	11.01 .10	82.0 1.7	47.80 .08	66.5 0.3
Oct. 6.1	41.39 .41	66.5 3.5	8.00 .12	73.0 2.2	10.92 .07	80.2 2.0	47.73 .05	66.2 0.2
16.0	41.05 .27	62.9 3.7	7.92 -.04	70.7 2.3	10.87 -.03	78.0 2.3	47.71 -.01	66.1 +0.1
26.0	40.85 -.12	59.1 -3.9	7.93 +.05	68.4 +2.3	10.87 +.02	75.6 -2.5	47.72 +.04	66.1 -0.1
Nov. 5.0	40.80 +.04	55.2 3.9	8.02 .15	66.2 2.1	10.92 .07	72.9 2.8	47.79 .09	66.4 0.4
15.0	40.92 .20	51.2 3.9	8.22 .24	64.2 1.9	11.02 .13	70.0 3.0	47.91 .14	66.9 0.6
24.9	41.21 .37	47.4 3.8	8.50 .33	62.4 1.6	11.17 .16	67.0 3.1	48.08 .19	67.6 0.8
Dec. 4.9	41.65 .52	43.7 3.5	8.87 .40	61.0 1.9	11.37 .23	63.9 3.1	48.29 .24	68.5 1.1
14.9	42.25 +.67	40.3 -3.2	9.31 +.47	60.1 +0.7	11.62 +.27	60.9 -3.0	48.55 +.28	69.7 -1.3
24.8	42.99 .79	37.2 2.7	9.80 .52	59.6 +0.3	11.91 .30	57.9 2.8	48.85 .31	71.1 1.5
34.8	43.84 +.20	34.9 -2.3	10.34 +.55	59.6 -0.2	12.23 +.33	55.2 -2.5	49.16 +.33	72.7 -1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ^1 Bootis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h 14 50	^m +74° 35'	^h 14 57	^m +40° 49'	^h 15 11	^m — 8° 58'	^h 15 20	^m +37° 45'
(Dec. 30.8)	^s 58.93 +.74	^s 66.7 —2.7	^s 46.35 +.34	^s 22.0 —2.9	^s 3.33 +.30	^s 29.8 —1.7	^s 18.21 +.31	^s 42.1 —3.0
Jan. 9.8	59.71 .82	64.3 2.1	46.70 .36	19.3 2.5	3.63 .31	31.5 1.7	18.53 .33	39.3 2.6
19.8	60.56 .87	62.4 1.5	47.07 .37	17.0 2.0	3.95 .32	33.2 1.7	18.87 .35	36.8 2.2
29.8	61.45 .90	61.2 0.9	47.45 .38	15.2 1.5	4.28 .33	34.9 1.6	19.23 .36	34.9 1.7
Feb. 8.7	62.36 .90	60.7 —0.2	47.83 .37	14.0 0.9	4.60 .31	36.5 1.5	19.60 .36	33.4 1.1
18.7	63.25 +.86	60.8 +0.5	48.19 +.35	13.4 —0.3	4.91 +.30	37.9 —1.3	19.95 +.35	32.6 —0.6
28.7	64.09 .80	61.6 1.1	48.54 .33	13.4 +0.3	5.20 .28	39.1 1.1	20.29 .33	32.3 0.0
Mar. 10.7	64.85 .71	63.0 1.7	48.85 .30	13.9 0.8	5.47 .26	40.1 0.9	20.61 .30	32.6 +0.6
20.6	65.51 .60	65.0 2.2	49.13 .26	15.1 1.3	5.71 .23	40.9 0.7	20.90 .27	33.5 1.1
30.6	66.06 .48	67.4 2.6	49.37 .22	16.6 1.8	5.94 .21	41.5 0.5	21.15 .24	34.8 1.6
Apr. 9.6	66.46 +.34	70.1 +2.9	49.57 +.18	18.6 +2.1	6.13 +.18	41.9 —0.3	21.37 +.20	36.6 +2.0
19.5	66.73 .30	73.1 3.0	49.73 .13	20.8 2.4	6.30 .15	42.0 —0.1	21.55 .16	38.7 2.2
29.5	66.86 +.06	76.2 3.1	49.84 .09	23.3 2.5	6.44 .12	42.0 +0.1	21.68 .19	41.1 2.4
May 9.5	66.84 —.06	79.3 3.1	49.91 .05	25.8 2.6	6.55 .10	41.9 0.2	21.78 .08	43.6 2.5
19.5	66.69 .22	82.3 2.9	49.94 +.01	28.4 2.5	6.63 .07	41.6 0.3	21.84 +.04	46.1 2.5
29.4	66.41 —.34	85.1 +2.6	49.92 —.03	30.9 +2.4	6.68 +.04	41.3 +0.3	21.85 .00	48.6 +2.4
June 8.4	66.01 .45	87.6 2.3	49.87 .07	33.2 2.2	6.70 +.01	40.9 0.4	21.83 —.04	51.0 2.3
18.4	65.51 .54	89.7 1.9	49.78 .10	35.3 1.9	6.70 —.02	40.5 0.4	21.77 .08	53.2 2.1
28.4	64.92 .60	91.4 1.5	49.66 .13	37.1 1.6	6.66 .05	40.1 0.4	21.68 .11	55.1 1.8
July 8.3	64.26 .60	92.6 1.0	49.51 .16	38.6 1.3	6.60 .07	39.6 0.4	21.55 .14	56.7 1.4
18.3	63.55 —.73	93.4 +0.5	49.34 —.18	39.7 +0.9	6.51 —.10	39.2 +0.4	21.40 —.17	58.0 +1.1
28.3	62.79 .76	93.5 0.0	49.14 .20	40.3 +0.4	6.40 .12	38.8 0.4	21.22 .19	58.9 0.7
Aug. 7.2	62.02 .76	93.2 —0.6	48.93 .21	40.6 0.0	6.28 .13	38.4 0.4	21.02 .20	59.4 +0.3
17.2	61.24 .77	92.3 1.1	48.72 .22	40.4 —0.4	6.14 .14	38.0 0.3	20.81 .21	59.5 —0.1
27.2	60.48 .74	90.9 1.6	48.50 .22	39.7 0.9	5.99 .14	37.7 0.3	20.60 .21	59.1 0.6
Sept. 6.2	59.76 —.60	89.1 —2.1	48.28 —.20	38.6 —1.3	5.85 —.14	37.5 +0.2	20.38 —.21	58.3 —1.0
16.1	59.09 .63	86.7 2.5	48.09 .18	37.1 1.7	5.71 .12	37.3 +0.1	20.18 .19	57.1 1.4
26.1	58.50 .55	84.0 2.9	47.92 .15	35.2 2.1	5.60 .10	37.2 0.0	20.00 .17	55.5 1.8
Oct. 6.1	58.00 .45	80.9 3.3	47.78 .12	32.9 2.5	5.51 .07	37.3 —0.2	19.85 .14	53.5 2.2
16.1	57.60 .33	77.4 3.6	47.68 .07	30.3 2.8	5.46 —.03	37.5 0.3	19.73 .09	51.1 2.5
26.0	57.34 —.20	73.7 —3.8	47.64 —.02	27.3 —3.1	5.45 +.01	38.0 —0.5	19.66 —.04	48.3 —2.9
Nov. 5.0	57.21 —.05	69.9 3.9	47.65 +.04	24.1 3.3	5.49 .06	38.6 0.7	19.65 +.01	45.4 3.1
15.0	57.23 +.10	65.9 3.9	47.71 .10	20.7 3.5	5.58 .11	39.4 1.0	19.69 .07	42.1 3.3
25.0	57.40 .25	62.0 3.8	47.84 .16	17.2 3.6	5.72 .16	40.5 1.2	19.79 .13	38.8 3.4
Dec. 4.9	57.73 .40	58.2 3.7	48.03 .21	13.7 3.5	5.90 .21	41.8 1.4	19.95 .19	35.3 3.4
14.9	58.20 +.54	54.7 —3.4	48.27 +.26	10.3 —3.3	6.13 +.25	43.3 —1.5	20.16 +.24	31.9 —3.3
24.9	58.80 .66	51.5 3.0	48.56 .31	7.0 3.1	6.40 .28	44.9 1.7	20.43 .28	28.7 3.2
34.8	59.52 +.77	48.7 —2.5	48.89 +.35	4.0 —2.2	6.70 +.31	46.6 —1.7	20.73 +.32	25.6 —3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^s Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ϵ Serpentis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 15 ^m 20	+72° 13'	^h 15 ^m 29	+27° 4'	^h 15 ^m 38	+ 6° 46'	^h 15 ^m 45	+ 4° 48'
(Dec.30.9)	^s 51.42 +.58	21.3 -3.0	^s 59.97 +.25	63.3 -2.8	^s 49.02 +.27	20.7 -2.2	^s 17.97 +.26	35.3 -2.2
Jan. 9.8	52.05 .67	18.5 2.5	60.24 .30	60.6 2.6	49.31 .29	18.5 2.1	18.25 .29	33.2 2.1
19.8	52.76 .73	16.2 1.9	60.56 .32	58.2 2.2	49.61 .31	16.4 1.9	18.55 .30	31.2 1.9
29.8	53.52 .77	14.6 1.3	60.89 .33	56.2 1.8	49.92 .31	14.6 1.7	18.86 .31	29.4 1.7
Feb. 8.8	54.31 .79	13.6 -0.7	61.23 .33	54.6 1.3	50.23 .31	13.0 1.4	19.17 .31	27.8 1.4
18.7	55.10 +.77	13.3 0.0	61.56 +.32	53.5 -0.8	50.54 +.30	11.7 -1.1	19.48 +.30	26.5 -1.1
28.7	55.86 .74	13.7 +0.7	61.87 .30	53.0 -0.3	50.84 .29	10.8 0.8	19.78 .29	25.5 0.8
Mar. 10.7	56.57 .67	14.7 1.3	62.17 .28	52.9 +0.2	51.12 .27	10.2 -0.4	20.06 .27	24.9 0.4
20.6	57.21 .59	16.3 1.9	62.44 .26	53.4 0.7	51.38 .25	10.0 0.0	20.32 .25	24.7 -0.1
30.6	57.75 .49	18.4 2.3	62.68 .23	54.3 1.1	51.61 .22	10.2 +0.3	20.56 .23	24.8 +0.2
Apr. 9.6	58.19 +.39	20.9 +2.7	62.89 +.30	55.7 +1.5	51.82 +.30	10.6 +0.6	20.77 +.30	25.1 +0.5
19.6	58.52 .27	23.8 3.0	63.07 .16	57.3 1.8	52.01 .17	11.3 0.8	20.97 .18	25.8 0.7
29.5	58.73 .15	26.8 3.1	63.22 .13	59.3 2.0	52.16 .14	12.3 1.0	21.13 .15	26.6 0.9
May 9.5	58.81 +.01	30.0 3.1	63.33 .09	61.3 2.1	52.29 .11	13.4 1.2	21.27 .12	27.6 1.1
19.5	58.78 -.11	33.1 3.0	63.40 .06	63.5 2.2	52.39 .08	14.6 1.2	21.37 .09	28.7 1.2
29.4	58.62 -.21	36.0 +2.9	63.45 +.02	65.7 +2.1	52.46 +.05	15.9 +1.3	21.45 +.06	29.9 +1.2
June 8.4	58.36 .31	38.8 2.6	63.45 -.01	67.8 2.0	52.49 +.02	17.1 1.2	21.49 +.03	31.1 1.1
18.4	58.00 .41	41.2 2.2	63.43 .04	69.7 1.9	52.50 -.01	18.3 1.2	21.51 .00	32.2 1.1
28.4	57.55 .49	43.3 1.8	63.37 .07	71.5 1.6	52.48 .04	19.5 1.1	21.49 -.03	33.3 1.0
July 8.3	57.02 .56	44.9 1.4	63.28 .10	73.0 1.4	52.43 .07	20.5 1.0	21.44 .06	34.3 0.9
18.3	56.43 -.61	46.1 +0.9	63.17 -.13	74.3 +1.1	52.35 -.00	21.4 +0.8	21.36 -.09	35.1 +0.8
28.3	55.79 .65	46.7 +0.4	63.02 .15	75.2 0.8	52.24 .12	22.1 0.6	21.26 .11	35.8 0.6
Aug. 7.3	55.12 .68	46.9 -0.1	62.86 .17	75.8 0.4	52.11 .14	22.6 0.5	21.14 .13	36.4 0.5
17.2	54.43 .69	46.6 0.7	62.69 .18	76.0 +0.1	51.97 .15	23.0 0.3	21.00 .15	36.8 0.3
27.2	53.74 .68	45.6 1.2	62.50 .18	75.9 -0.3	51.81 .16	23.2 +0.1	20.84 .15	37.0 +0.1
Sept. 6.2	53.07 -.85	44.1 -1.7	62.32 -.18	75.4 -0.7	51.66 -.15	23.1 -0.2	20.69 -.15	37.0 -0.1
16.1	52.44 .61	42.2 2.2	62.15 .17	74.6 1.0	51.51 .14	22.9 0.4	20.54 .14	36.8 0.3
26.1	51.85 .55	39.8 2.6	61.99 .15	73.4 1.4	51.37 .12	22.4 0.6	20.40 .13	36.4 0.5
Oct. 6.1	51.34 .47	37.0 3.0	61.85 .19	71.8 1.8	51.26 .10	21.6 0.9	20.28 .10	35.7 0.8
16.1	50.91 .37	33.9 3.3	61.76 .08	69.8 2.1	51.18 .06	20.7 1.1	20.20 .07	34.9 1.0
26.0	50.59 -.26	30.4 -3.6	61.70 -.03	67.6 -2.4	51.14 -.02	19.4 -1.4	20.15 -.03	33.7 -1.2
Nov. 5.0	50.39 .14	26.7 3.2	61.69 +.02	65.1 2.6	51.14 +.03	17.9 1.6	20.15 +.02	32.4 1.5
15.0	50.31 -.01	22.8 3.9	61.73 .07	62.3 2.8	51.19 .06	16.2 1.8	20.19 .07	30.8 1.7
25.0	50.37 +.13	18.9 3.9	61.83 .19	59.4 3.0	51.29 .13	14.3 2.0	20.29 .12	29.0 1.9
Dec. 4.9	50.57 .26	15.0 3.8	61.98 .17	56.3 3.1	51.44 .18	12.3 2.1	20.44 .17	27.1 2.0
14.9	50.90 +.39	11.3 -3.6	62.18 +.22	53.2 -3.0	51.61 +.22	10.1 -2.2	20.63 +.21	25.0 -2.1
24.9	51.35 .52	7.9 3.3	62.42 .26	50.2 2.9	51.85 .25	7.8 2.2	20.86 .25	22.9 2.1
34.8	51.93 +.64	4.8 -2.9	62.70 +.29	47.3 -2.8	52.15 +.26	5.6 -2.2	21.12 +.26	20.7 -2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpîi.		β¹ Scorpîi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h 15 47	^m +78° 7'	^h 15 53	^m +27° 11'	^h 15 53	^m -22° 18'	^h 15 59	^m -19° 30'
(Dec.30.9)	^s 55.66 +.69	47.8 -3.1	^s 0.08 +.26	45.1 -2.9	^s 47.48 +.29	21.1 -0.9	^s 0.21 +.28	6.8 -1.0
Jan. 9.9	56.44 .85	44.9 2.7	0.35 .29	42.3 2.6	47.78 .31	22.0 1.0	0.50 .30	7.9 1.1
19.8	57.35 .97	42.4 2.2	0.66 .31	39.8 2.3	48.11 .33	23.1 1.1	0.82 .32	9.1 1.2
29.8	58.38 1.06	40.5 1.6	0.98 .32	37.6 1.9	48.44 .34	24.3 1.2	1.15 .33	10.3 1.3
Feb. 8.8	59.47 1.11	39.3 0.9	1.31 .33	35.9 1.4	48.78 .34	25.5 1.2	1.48 .33	11.5 1.3
18.8	60.60 +1.12	38.7 -0.2	1.64 +.32	34.7 -0.9	49.12 +.33	26.8 -1.2	1.81 +.32	12.7 -1.2
28.7	61.71 1.09	38.8 +0.4	1.95 .31	34.1 -0.4	49.44 .32	27.9 1.1	2.13 .31	13.8 1.1
Mar. 10.7	62.77 1.02	39.5 1.0	2.26 .29	33.9 +0.1	49.75 .30	29.0 1.1	2.43 .30	14.9 1.0
20.7	63.75 .92	40.9 1.6	2.54 .27	34.3 0.6	50.04 .28	30.1 1.0	2.72 .28	15.8 0.8
30.6	64.61 .79	42.8 2.1	2.80 .24	35.1 1.1	50.31 .26	31.0 0.9	2.99 .26	16.6 0.7
Apr. 9.6	65.33 +.64	45.1 +2.5	3.03 +.21	36.4 +1.5	50.56 +.23	31.8 -0.8	3.23 +.23	17.2 -0.6
19.6	65.88 .47	47.8 2.8	3.23 .18	38.0 1.8	50.78 .21	32.5 0.6	3.45 .21	17.8 0.5
29.6	66.26 .29	50.8 3.0	3.40 .15	39.9 2.0	50.97 .18	33.1 0.5	3.65 .18	18.2 0.4
May 9.5	66.46 +.10	53.9 3.1	3.53 .12	42.0 2.1	51.13 .15	33.6 0.5	3.82 .15	18.5 0.3
19.5	66.47 -0.08	57.1 3.1	3.63 .08	44.2 2.2	51.27 .12	34.0 0.4	3.95 .12	18.8 0.2
29.5	66.30 -0.26	60.1 +3.0	3.70 +.04	46.5 +2.2	51.37 +.08	34.4 -0.3	4.06 +.09	19.0 -0.2
June 8.5	65.95 .43	63.0 2.7	3.72 +.01	48.7 2.1	51.44 .05	34.7 0.3	4.13 .06	19.1 0.1
18.4	65.45 .58	65.6 2.4	3.72 -0.02	50.8 2.0	51.47 +.02	34.9 0.2	4.17 +.02	19.2 -0.1
28.4	64.79 .72	67.9 2.1	3.68 .06	52.7 1.8	51.47 -0.02	35.1 0.2	4.17 -0.01	19.2 0.0
July 8.4	64.01 .83	69.8 1.7	3.60 .00	54.4 1.5	51.43 .05	35.3 -0.1	4.14 .05	19.2 0.0
18.3	63.12 -0.23	71.2 +1.2	3.49 -0.12	55.8 +1.2	51.36 -0.08	35.3 0.0	4.07 -0.06	19.2 +0.1
28.3	62.15 1.01	72.1 0.7	3.36 .15	56.9 1.0	51.26 .11	35.3 +0.1	3.97 .11	19.1 0.1
Aug. 7.3	61.11 1.06	72.6 +0.2	3.20 .17	57.7 0.8	51.13 .14	35.2 0.1	3.85 .13	19.0 0.2
17.3	60.03 1.09	72.5 -0.3	3.02 .18	58.1 +0.2	50.98 .16	35.0 0.2	3.71 .15	18.8 0.2
27.2	58.93 1.09	71.9 0.8	2.84 .19	58.1 -0.1	50.82 .16	34.8 0.3	3.55 .16	18.5 0.3
Sept. 6.2	57.85 -1.07	70.8 -1.3	2.64 -0.19	57.8 -0.5	50.66 -0.17	34.4 +0.3	3.39 -0.16	18.3 +0.3
16.2	56.80 1.02	69.2 1.8	2.45 .18	57.2 0.9	50.49 .16	34.1 0.4	3.22 .16	17.9 0.3
26.2	55.81 .94	67.1 2.3	2.28 .16	56.1 1.3	50.34 .14	33.6 0.4	3.08 .14	17.6 0.3
Oct. 6.1	54.92 .84	64.6 2.7	2.13 .14	54.6 1.6	50.22 .11	33.2 0.4	2.95 .11	17.3 0.3
16.1	54.14 .71	61.7 3.1	2.01 .10	52.9 2.0	50.13 .07	32.8 0.3	2.86 .07	17.1 0.2
26.1	53.50 -0.56	58.4 -3.4	1.93 -0.06	50.7 -2.3	50.08 -0.02	32.5 +0.3	2.80 -0.03	16.9 +0.1
Nov. 5.0	53.02 .39	54.9 3.6	1.89 -0.01	48.3 2.6	50.08 +0.03	32.3 +0.3	2.80 +0.02	16.8 0.0
15.0	52.72 .20	51.2 3.6	1.91 +0.04	45.6 2.8	50.13 .08	32.2 0.0	2.84 .07	16.9 -0.2
25.0	52.61 -0.01	47.4 3.8	1.98 .10	42.7 3.0	50.24 .13	32.3 -0.2	2.94 .12	17.2 0.4
Dec. 5.0	52.71 +.20	43.5 3.8	2.10 .15	39.7 3.1	50.40 .18	32.7 0.4	3.09 .17	17.7 0.6
14.9	53.01 +.40	39.8 -3.7	2.28 +.20	36.6 -3.1	50.61 +.23	33.2 -0.6	3.30 +.22	18.3 -0.7
24.9	53.50 .58	36.2 3.4	2.50 .24	33.6 3.0	50.86 .27	33.9 0.8	3.54 .26	19.2 0.9
34.9	54.17 +.76	33.0 -3.0	2.76 +.26	30.6 -2.9	51.15 +.31	34.8 -1.0	3.82 +.30	20.1 -1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		η Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 16	^m 5	^h 16	^m 8	^h 16	^m 16	^h 16	^m 22
		+68° 5'		— 3° 24'		+46° 34'		+61° 45'
(Dec. 30.9)	58.18 +.30	51.9 —3.4	32.73 +.25	34.9 —1.7	23.84 +.26	25.6 —3.4	27.55 +.31	40.5 —3.5
Jan. 9.9	58.63 .48	48.7 3.0	33.00 .28	36.7 1.7	24.13 .31	22.4 3.0	27.90 .38	37.2 3.1
	59.15 .55	45.9 2.5	33.29 .30	38.4 1.7	24.46 .34	19.6 2.6	28.31 .44	34.3 2.7
	59.74 .61	43.7 1.9	33.59 .31	40.0 1.6	24.82 .37	17.2 2.1	28.78 .48	31.8 2.2
Feb. 8.8	60.36 .64	42.1 1.3	33.90 .31	41.5 1.4	25.20 .38	15.3 1.6	29.28 .51	29.9 1.5
	61.01 +.65	41.1 —0.6	34.21 +.31	42.7 —1.1	25.59 +.39	14.0 —1.0	29.80 +.52	28.7 —0.9
	61.66 .64	40.8 +0.1	34.51 .30	43.8 0.9	25.98 .38	13.4 —0.3	30.32 .50	26.2 —0.2
Mar. 10.7	62.29 .61	41.2 0.7	34.80 .28	44.5 0.6	26.36 .37	13.4 +0.3	30.84 .50	23.3 +0.4
	62.87 .56	42.3 1.3	35.08 .27	45.0 0.3	26.71 .34	14.0 0.9	31.33 .47	29.0 1.1
	63.40 .40	43.9 1.9	35.33 .25	45.2 —0.1	27.04 .31	15.2 1.5	31.77 .48	30.4 1.7
Apr. 9.6	63.86 +.42	46.1 +2.4	35.57 +.22	45.1 +0.2	27.33 +.27	16.9 +1.9	32.17 +.37	32.4 +2.2
	64.23 .33	48.6 2.7	35.78 .20	44.8 0.4	27.59 .23	19.1 2.3	32.51 .31	34.8 2.6
	64.52 .24	51.5 3.0	35.97 .17	44.4 0.5	27.80 .19	21.6 2.6	32.78 .24	37.5 2.9
May 9.5	64.71 .14	54.6 3.1	36.13 .15	43.8 0.6	27.98 .14	24.3 2.8	32.99 .16	40.5 3.1
	64.80 +.04	57.8 3.2	36.26 .12	43.1 0.7	28.08 .09	27.2 2.9	33.11 .09	43.6 3.1
	64.80 —.05	60.9 +3.1	36.37 +.09	42.3 +0.2	28.15 +.04	30.1 +2.9	33.17 +.02	46.8 +3.1
June 5.5	64.70 .14	64.0 2.9	36.44 .06	41.5 0.8	28.17 —.01	33.0 2.8	33.14 —.06	49.9 3.0
	64.51 .23	66.8 2.7	36.48 +.02	40.7 0.8	28.14 .05	35.7 2.6	33.05 .13	52.8 2.8
	64.23 .31	69.3 2.3	36.48 —.01	39.9 0.7	28.06 .09	38.2 2.4	32.88 .20	55.5 2.5
July 8.4	63.88 .39	71.5 1.9	36.46 .04	39.3 0.7	27.94 .14	40.4 2.1	32.65 .26	57.9 2.2
	63.46 —.45	73.3 +1.5	36.40 —.07	38.6 +0.6	27.77 —.18	42.3 +1.7	32.36 —.32	59.9 +1.8
	62.98 .50	74.6 1.1	36.31 .10	38.1 0.5	27.57 .22	43.8 1.3	32.02 .36	61.5 1.3
Aug. 7.3	62.46 .54	75.5 0.6	36.19 .13	37.6 0.4	27.34 .25	44.9 0.8	31.63 .40	62.6 0.9
	61.90 .57	75.8 +0.1	36.06 .14	37.2 0.3	27.08 .27	45.5 +0.4	31.21 .43	63.2 +0.4
	61.32 .58	75.6 —0.6	35.91 .15	37.0 0.2	26.80 .28	45.6 —0.1	30.77 .45	63.3 —0.2
Sept. 6.2	60.74 —.52	74.9 —1.0	35.75 —.16	36.9 +0.1	26.52 —.28	45.3 —0.6	30.32 —.45	62.9 —0.7
	60.17 .56	73.6 1.5	35.59 .15	36.9 —0.1	26.24 .27	44.5 1.0	29.87 .44	62.0 1.2
	59.63 .58	71.9 2.0	35.44 .14	37.0 0.2	25.97 .26	43.2 1.5	29.44 .41	60.5 1.7
Oct. 6.1	59.13 .47	69.7 2.4	35.32 .11	37.3 0.4	25.72 .23	41.4 2.0	29.04 .38	58.6 2.2
	58.69 .40	67.0 2.8	35.22 .08	37.8 0.6	25.51 .19	39.3 2.4	28.69 .38	56.2 2.6
	58.33 —.32	64.0 —3.2	35.16 —.04	38.4 —0.7	25.35 —.14	36.7 —2.6	28.40 —.28	53.4 —3.0
Nov. 5.0	58.06 .22	60.6 3.5	35.14 +.01	39.3 0.9	25.23 .08	33.7 3.1	28.17 .18	50.2 3.2
	57.89 —.11	57.0 3.7	35.17 .05	40.3 1.1	25.18 —.02	30.5 3.4	28.03 .10	46.7 3.6
	57.83 .00	53.2 3.8	35.25 .10	41.6 1.3	25.19 +.04	27.0 3.5	27.97 —.01	43.0 3.7
Dec. 5.0	57.89 +.11	49.3 3.9	35.37 .15	43.0 1.5	25.27 .11	23.4 3.6	28.00 +.08	39.2 3.6
	58.06 +.22	45.5 —3.8	35.55 +.20	44.6 —1.6	25.41 +.17	19.8 —3.6	28.13 +.17	35.4 —3.8
	58.34 .33	41.8 3.6	35.77 .24	46.3 1.7	25.61 .23	16.2 3.5	28.35 .28	31.6 3.6
	58.73 +.44	38.3 —3.3	36.02 +.27	48.0 —1.8	25.87 +.29	12.7 —3.4	28.65 +.34	28.1 —3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Scorpii. (Antares.)		β Herculis.		Λ Draconis		ζ Ophiuchi.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 16 22	^m —26° 11'	^h 16 25	^m +21° 43'	^h 16 28	^m +69° 0'	^h 16 31	^m —10° 20'
(Dec 30.9)	^s 37.29 +.37	^s 7.0 —0.5	^s 27.38 +.23	^s 45.0 —2.5	^s 8.95 +.35	^s 14.0 —3.5	^s 3.83 +.24	^s 33.7 —1.3
Jan. 9.9	37.58 .30	7.6 0.7	27.63 .96	42.3 2.6	9.36 .45	10.7 3.1	4.09 .97	35.0 1.3
19.8	37.90 .32	8.3 0.8	27.90 .29	39.8 2.3	9.85 .53	7.7 2.7	4.37 .99	36.4 1.3
29.8	38.23 .34	9.2 0.9	28.20 .30	37.6 2.0	10.42 .60	5.3 2.2	4.67 .31	37.7 1.3
Feb. 8.8	38.58 .34	10.1 0.9	28.51 .31	35.8 1.6	11.05 .64	3.4 1.5	4.98 .31	38.9 1.2
18.8	38.92 +.34	11.1 —1.0	28.83 +.31	34.5 —1.1	11.71 +.66	2.2 —0.9	5.29 +.31	40.1 —1.0
28.7	39.26 .33	12.0 1.0	29.14 .31	33.6 0.6	12.37 .66	1.6 —0.2	5.60 .30	41.0 0.8
Mar. 10.7	39.59 .32	13.0 0.9	29.44 .30	33.2 —0.1	13.03 .64	1.7 +0.5	5.91 .29	41.8 0.7
20.7	39.90 .31	13.9 0.9	29.73 .28	33.3 +0.3	13.66 .60	2.5 1.1	6.19 .28	42.3 0.5
30.7	40.20 .29	14.7 0.8	30.00 .26	33.8 0.2	14.24 .55	3.9 1.7	6.47 .26	42.7 —0.2
Apr. 9.6	40.47 +.26	15.5 —0.8	30.24 +.23	34.8 +1.2	14.75 +.47	5.9 +2.2	6.72 +.24	42.8 0.0
19.6	40.72 .24	16.2 0.7	30.47 .21	36.1 1.5	15.18 .39	8.3 2.6	6.96 .22	42.8 +0.1
29.6	40.95 .21	16.9 0.6	30.66 .18	37.8 1.8	15.52 .30	11.0 2.9	7.17 .20	42.6 0.2
May 9.5	41.15 .18	17.5 0.6	30.83 .15	39.7 2.0	15.77 .20	14.1 3.1	7.36 .17	42.3 0.3
19.5	41.32 .15	18.0 0.5	30.96 .12	41.7 2.1	15.92 +.10	17.2 3.2	7.52 .14	41.9 0.4
29.5	41.45 +.12	18.6 —0.5	31.06 +.08	43.8 +2.1	15.96 —.01	20.4 +3.2	7.65 +.11	41.5 +0.5
June 8.5	41.55 .08	19.0 0.5	31.13 .05	45.9 2.1	15.90 .11	23.6 3.1	7.75 .08	41.0 0.5
18.4	41.61 .04	19.5 0.4	31.16 +.01	47.9 2.0	15.75 .20	26.5 2.9	7.81 .04	40.5 0.5
28.4	41.64 +.01	19.9 0.4	31.15 —.03	49.9 1.8	15.50 .29	29.3 2.6	7.83 +.01	40.1 0.4
July 8.4	41.62 —.03	20.2 0.3	31.11 .06	51.6 1.6	15.16 .37	31.7 2.2	7.83 —.03	39.7 0.4
18.4	41.57 —.07	20.5 —0.2	31.03 —.09	53.1 +1.4	14.75 —.45	33.7 +1.8	7.78 —.06	39.3 +0.4
28.3	41.48 .10	20.7 0.2	30.92 .12	54.3 1.1	14.27 .51	35.3 1.4	7.71 .09	38.9 0.3
Aug. 7.3	41.36 .13	20.8 —0.1	30.79 .15	55.3 0.8	13.73 .56	36.4 0.9	7.60 .12	38.6 0.3
17.3	41.22 .16	20.8 +0.1	30.63 .17	55.9 0.5	13.15 .59	37.1 +0.4	7.47 .14	38.3 0.2
27.2	41.05 .17	20.7 0.2	30.45 .18	56.3 +0.1	12.54 .61	37.2 —0.1	7.32 .16	38.1 0.2
Sept. 6.2	40.87 —.18	20.5 +0.3	30.26 —.18	56.2 —0.2	11.92 —.62	36.8 —0.7	7.16 —.18	38.0 +0.1
16.2	40.69 .17	20.2 0.4	30.07 .18	55.9 0.5	11.30 .61	35.9 1.2	6.99 .16	37.9 +0.1
26.2	40.53 .16	19.8 0.4	29.89 .17	55.2 0.9	10.70 .58	34.5 1.7	6.84 .15	37.8 0.0
Oct. 6.1	40.38 .13	19.4 0.5	29.73 .15	54.1 1.2	10.14 .53	32.5 2.2	6.70 .13	37.9 —0.1
16.1	40.26 .10	18.9 0.5	29.60 .12	52.7 1.6	9.64 .47	30.1 2.6	6.59 .10	38.1 0.2
26.1	40.19 —.05	18.4 +0.4	29.50 —.08	51.0 —1.9	9.21 —.39	27.3 —3.0	6.51 —.06	38.4 —0.4
Nov. 5.1	40.16 .00	18.0 0.4	29.44 —.03	49.0 2.2	8.87 .29	24.2 3.3	6.47 —.01	38.8 0.5
15.0	40.18 +.05	17.7 0.3	29.43 +.02	46.6 2.4	8.63 .18	20.7 3.6	6.48 +.04	39.4 0.7
25.0	40.26 .11	17.5 +0.1	29.47 .07	44.1 2.6	8.50 —.07	17.0 3.8	6.54 .09	40.2 0.8
Dec. 5.0	40.40 .16	17.5 —0.1	29.56 .12	41.4 2.7	8.49 +.05	13.1 3.8	6.66 .14	41.1 1.0
14.9	40.58 +.21	17.6 —0.2	29.70 +.17	38.6 —2.6	8.60 +.17	9.3 —3.6	6.82 +.18	42.2 —1.1
24.9	40.82 .25	17.9 0.4	29.89 .21	35.7 2.8	8.82 .28	5.5 3.7	7.02 .22	43.4 1.2
34.0	41.09 +.29	18.4 —0.6	30.12 +.25	32.9 —2.7	9.16 +.39	2.0 —3.4	7.26 +.26	44.7 —1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		ϵ Ursæ Minoris.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h ^m 16 36	—68° 49'	^h ^m 16 39	+39° 7'	^h ^m 16 52	+ 9° 32'	^h ^m 16 57	+82° 12'
(Dec.30.9)	^s 56.07 +.54	15.5 +1.6	^s 5.24 +.22	49.9 —3.3	^s 25.51 +.21	47.4 —2.3	^s 8.51 +.53	56.0 —3.5
Jan. 9.9	56.66 .68	13.9 1.4	5.48 .97	46.7 3.0	25.74 .94	45.2 2.9	9.20 .69	52.6 3.9
19.9	57.32 .69	12.7 1.9	5.77 .30	43.8 2.7	25.99 .97	43.1 2.0	10.15 1.08	49.6 2.8
29.9	58.04 .73	12.0 0.5	6.09 .33	41.3 2.3	26.27 .98	41.1 1.7	11.35 1.20	47.0 2.3
Feb. 8.8	58.79 .76	11.6 +0.1	6.43 .34	39.3 1.8	26.56 .99	39.5 1.4	12.74 1.46	45.0 1.8
18.8	59.56 +.77	11.7 —0.3	6.78 +.35	37.8 —1.2	26.86 +.30	38.2 —1.2	14.27+1.57	43.5 —1.2
28.8	60.33 .77	12.2 0.7	7.13 .35	36.9 —0.6	27.16 .30	37.2 0.8	15.69 1.63	42.7 —0.5
Mar. 10.7	61.10 .75	13.1 1.0	7.48 .34	36.6 0.0	27.45 .29	36.6 —0.4	17.53 1.68	42.5 +0.2
20.7	61.83 .79	14.3 1.4	7.81 .32	36.9 +0.6	27.74 .28	36.4 0.0	19.12 1.55	43.0 0.8
30.7	62.53 .68	15.9 1.7	8.12 .30	37.8 1.1	28.01 .27	36.6 +0.4	20.62 1.43	44.1 1.4
Apr. 9.6	63.18 +.63	17.8 —2.0	8.41 +.27	39.1 +1.6	28.27 +.25	37.2 +0.7	21.98+1.28	45.8 +1.9
19.6	63.78 .56	19.9 2.2	8.67 .24	41.0 2.0	28.51 .23	38.0 1.0	23.14 1.65	47.9 2.4
29.6	64.31 .49	22.2 2.4	8.89 .20	43.2 2.4	28.73 .20	39.2 1.2	24.07 .80	50.5 2.7
May 9.6	64.76 .41	24.7 2.6	9.09 .16	45.7 2.6	28.92 .18	40.5 1.4	24.74 .54	53.3 2.9
19.5	65.14 .23	27.3 2.6	9.22 .12	48.4 2.7	29.08 .15	42.0 1.5	25.15 +.26	56.4 3.1
29.5	65.42 +.24	30.0 —2.7	9.32 +.08	51.2 +2.8	29.22 +.12	43.6 +1.6	25.27 —.02	59.5 +3.1
June 8.5	65.61 .14	32.7 2.7	9.38 +.04	53.9 2.7	29.32 .08	45.2 1.6	25.11 .30	62.6 3.1
18.5	65.70 +.04	35.3 2.6	9.39 —.01	56.6 2.6	29.38 .05	46.8 1.6	24.68 .57	65.6 2.9
28.4	65.68 —.06	37.9 2.4	9.37 .05	59.1 2.4	29.41 +.01	48.4 1.4	23.98 .82	68.5 2.7
July 8.4	65.57 .16	40.2 2.2	9.29 .09	61.4 2.1	29.41 —.02	49.7 1.3	23.04 1.05	71.0 2.4
18.4	65.37 —.25	42.3 —1.9	9.18 —.13	63.4 +1.8	29.37 —.06	51.0 +1.2	21.88—1.22	73.2 +2.0
28.3	65.07 .33	44.1 1.6	9.03 .17	65.0 1.4	29.29 .09	52.0 1.0	20.53 1.43	75.1 1.6
Aug. 7.3	64.70 .40	45.5 1.2	8.84 .20	66.3 1.0	29.18 .12	52.9 0.8	19.01 1.58	76.5 1.2
17.3	64.26 .46	46.5 0.8	8.63 .22	67.2 0.6	29.05 .14	53.6 0.5	17.37 1.69	77.4 0.7
27.3	63.78 .49	47.0 —0.3	8.40 .24	67.6 +0.2	28.89 .16	54.0 0.3	15.64 1.76	77.8 +0.2
Sept. 6.2	63.27 —.51	47.1 +0.2	8.15 —.25	67.6 —0.2	28.72 —.17	54.1 +0.1	13.86—1.79	77.2 —0.3
16.2	62.77 .50	46.7 0.6	7.90 .24	67.1 0.7	28.55 .17	54.1 —0.2	12.06 1.78	77.2 0.8
26.2	62.28 .47	45.8 1.1	7.66 .23	66.2 1.1	28.38 .17	53.8 0.5	10.29 1.73	76.1 1.3
Oct. 6.2	61.84 .41	44.5 1.5	7.44 .21	64.8 1.6	28.22 .15	53.2 0.7	8.59 1.64	74.6 1.8
16.1	61.46 .33	42.8 1.9	7.24 .18	63.0 2.0	28.08 .12	52.3 1.0	7.01 1.51	72.6 2.2
26.1	61.18 —.23	40.7 +2.2	7.09 —.14	60.8 —2.4	27.92 —.08	51.2 —1.2	5.58—1.33	70.1 —2.6
Nov. 5.1	61.00 —.12	38.5 2.4	6.97 .09	58.3 2.7	27.91 —.04	49.8 1.5	4.35 1.12	67.3 3.0
15.0	60.95 .00	36.0 2.5	6.91 —.03	55.4 3.0	27.89 .00	48.2 1.7	3.35 .87	64.1 3.3
25.0	61.01 +.13	33.6 2.5	6.91 +.03	52.2 3.3	27.92 +.05	46.4 1.9	2.61 .59	60.7 3.5
Dec. 5.0	61.21 .28	31.1 2.4	6.96 .00	48.9 3.4	27.99 .10	44.3 2.1	2.17 —.20	57.1 3.6
15.0	61.53 +.38	28.8 +2.2	7.08 +.15	45.4 —3.4	28.11 +.14	42.1 —2.2	2.03 +.03	53.4 —3.7
24.9	61.97 .49	26.8 1.9	7.25 .20	42.0 3.4	28.28 .19	39.9 2.9	2.21 .33	49.7 3.6
34.9	62.51 +.58	25.0 +1.6	7.47 +.24	38.7 —3.9	28.49 +.24	37.7 —2.2	2.70 +.64	46.2 —3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Herculis.		α^1 Herculis.		δ Ophiuchi.		β Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h 16 ^m 57	+33° 43'	^h 17 ^m 9	+14° 30'	^h 17 ^m 19	-24° 4'	^h 17 ^m 27	+52° 22'
(Dec.30.9)	^s 30.45 +.30	37." -3.2	^s 35.68 +.19	57." -2.5	^s 36.52 +.32	20." -0.3	^s 54.28 +.17	54." -3.6
Jan. 9.9	30.68 .94	31.1 3.0	35.89 .23	54.7 2.3	36.76 .96	21.2 0.4	54.48 .33	50.9 3.4
19.9	30.94 .98	31.2 2.7	36.14 .25	52.4 2.1	37.03 .98	21.6 0.5	54.75 .29	47.6 3.1
29.9	31.23 .30	28.6 2.3	36.40 .27	50.4 1.9	37.33 .30	22.1 0.5	55.06 .33	44.7 2.7
Feb. 8.8	31.54 .32	26.5 1.8	36.69 .29	48.6 1.6	37.64 .32	22.7 0.6	55.41 .37	42.2 2.2
18.8	31.87 +.33	24.9 -1.3	36.98 +.30	47.2 -1.2	37.97 +.33	23.2 -0.5	55.80 +.40	40.2 -1.6
28.8	32.20 .33	23.9 0.8	37.28 .30	46.1 0.8	38.30 .33	23.8 0.5	56.20 .41	38.9 1.0
Mar. 10.7	32.53 .32	23.4 -0.2	37.58 .30	45.5 -0.4	38.62 .33	24.3 0.5	56.62 .41	38.2 -0.4
20.7	32.85 .31	23.5 +0.4	37.87 .29	45.4 +0.1	38.95 .32	24.7 0.4	57.03 .41	38.2 +0.3
30.7	33.15 .30	24.2 0.9	38.16 .28	45.6 0.5	39.27 .31	25.1 0.3	57.43 .39	38.8 0.9
Apr. 9.7	33.44 +.27	25.3 +1.4	38.42 +.26	46.3 +0.9	39.57 +.30	25.4 -0.3	57.81 +.36	40.1 +1.5
19.6	33.70 .25	27.0 1.8	38.67 .24	47.3 1.2	39.86 .28	25.6 0.2	58.16 .33	41.8 2.0
29.6	33.93 .29	29.0 2.2	38.90 .26	48.7 1.5	40.13 .26	25.8 0.2	58.47 .29	44.1 2.4
May 9.6	34.13 .18	31.3 2.4	39.11 .19	50.3 1.7	40.38 .23	26.0 0.2	58.73 .24	46.7 2.8
19.6	34.30 .14	33.8 2.6	39.29 .16	52.0 1.8	40.60 .20	26.2 0.2	58.96 .19	49.6 3.0
29.5	34.42 +.11	36.4 +2.6	39.43 +.13	53.9 +1.9	40.79 +.17	26.4 -0.2	59.11 +.13	52.7 +3.1
June 8.5	34.51 .07	39.1 2.6	39.55 .10	55.8 1.9	40.95 .14	26.6 0.2	59.22 .07	55.8 3.2
18.5	34.55 +.02	41.6 2.5	39.62 .06	57.7 1.8	41.07 .10	26.8 0.2	59.26 +.02	59.0 3.1
28.4	34.55 -.02	44.1 2.4	39.66 +.02	59.5 1.7	41.14 .06	27.0 0.2	59.25 -.04	62.0 3.0
July 8.4	34.51 .06	46.4 2.1	39.67 -.02	61.2 1.6	41.18 +.02	27.3 0.2	59.17 .10	64.9 2.7
18.4	34.43 -1.0	48.4 +1.9	39.63 -.05	62.7 +1.4	41.17 -.03	27.5 -0.3	59.04 -.16	67.5 +2.4
28.4	34.31 .14	50.1 1.6	39.56 .09	64.0 1.2	41.13 .07	27.8 0.2	58.86 .21	69.8 2.1
Aug. 7.3	34.15 .17	51.5 1.2	39.46 .12	65.1 0.9	41.04 .10	28.0 0.2	58.62 .25	71.7 1.7
17.3	33.97 .20	53.5 0.8	39.32 .15	65.9 0.7	40.92 .13	28.2 0.1	58.35 .29	73.1 1.3
27.3	33.76 .22	53.2 +0.4	39.17 .17	66.4 0.4	40.77 .16	28.3 -0.1	58.04 .32	74.2 0.8
Sept. 6.3	33.54 -.23	53.4 0.0	38.99 -.18	66.7 +0.1	40.61 -.17	28.4 0.0	57.70 -.34	74.7 +0.3
16.2	33.31 .23	53.1 -0.4	38.81 .16	66.7 -0.2	40.43 .16	28.3 +0.1	57.36 .35	74.8 -0.2
26.2	33.08 .22	52.5 0.9	38.63 .18	66.4 0.5	40.25 .17	28.2 0.1	57.01 .35	74.3 0.7
Oct. 6.2	32.87 .20	51.4 1.3	38.46 .16	65.8 0.8	40.08 .16	28.1 0.2	56.66 .33	73.3 1.2
16.1	32.68 .17	49.9 1.7	38.30 .14	64.8 1.1	39.93 .13	27.9 0.2	56.35 .30	71.9 1.7
26.1	32.52 -1.4	48.0 -2.1	38.18 -1.0	63.6 -1.4	39.81 -1.0	27.7 +0.2	56.07 -.26	69.9 -2.2
Nov. 5.1	32.41 .09	45.7 2.4	38.10 .06	62.1 1.6	39.73 -.05	27.5 0.2	55.83 .21	67.5 2.6
15.1	32.34 -.04	43.1 2.7	38.05 -.02	60.3 1.9	39.70 .00	27.3 0.1	55.65 .15	64.7 3.0
25.0	32.33 +.01	40.2 3.0	38.06 +.03	58.3 2.1	39.72 +.05	27.1 +0.1	55.53 .08	61.5 3.3
Dec. 5.0	32.37 .07	37.1 2.9	38.11 .06	56.1 2.3	39.79 .10	27.1 0.0	55.48 -.01	58.1 3.5
15.0	32.47 +.12	33.9 -3.2	38.21 +.13	53.7 -2.4	39.92 +.15	27.2 -0.1	55.50 +.06	54.5 -3.6
25.0	32.62 .17	30.7 2.9	38.36 .17	51.2 2.4	40.09 .20	27.4 0.2	55.60 .13	50.9 3.6
34.9	32.82 +.22	27.5 -3.1	38.55 +.21	48.8 -2.4	40.31 +.24	27.7 -0.3	55.76 +.20	47.2 -3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ^1 Draconis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 17 29	^m +12° 38'	^h 17 37	^m +68° 48'	^h 17 42	^m +27° 46'	^h 17 43	^m +72° 11'
Jan. 0.0	47.44 +.17	24.9 -2.3	32.27 +.17	27.3 -3.7	6.95 +.15	64.8 -3.0	49.69 +.15	65.6 -3.7
9.9	47.63 .91	22.6 2.2	32.49 .98	23.7 3.5	7.13 .19	61.8 2.9	49.92 .99	61.9 3.5
19.9	47.85 .94	20.4 2.1	32.83 .36	20.3 3.2	7.34 .33	59.0 2.7	50.27 .41	58.5 3.2
29.9	48.11 .96	18.4 1.9	33.25 .47	17.3 2.8	7.59 .98	56.5 2.4	50.74 .52	55.4 2.9
Feb. 8.8	48.38 .96	16.6 1.6	33.77 .54	14.7 2.3	7.86 .98	54.3 2.0	51.31 .61	52.8 2.4
18.8	48.67 +.99	15.2 -1.2	34.34 +.80	12.6 -1.7	8.15 +.30	52.5 -1.5	51.96 +.68	50.6 -1.8
28.8	48.96 .30	14.2 0.8	34.96 .63	11.2 1.1	8.46 .31	51.2 1.0	52.67 .73	49.1 1.2
Mar. 10.8	49.26 .99	13.5 -0.4	35.60 .65	10.5 -0.4	8.77 .31	50.4 -0.5	53.42 .75	48.3 -0.5
20.7	49.55 .99	13.3 0.0	36.25 .64	10.4 +0.2	9.08 .31	50.3 0.0	54.17 .74	48.1 +0.2
30.7	49.84 .98	13.5 +0.4	36.88 .61	10.9 0.9	9.38 .30	50.5 +0.5	54.90 .72	48.6 0.8
Apr. 9.7	50.11 +.97	14.1 +0.8	37.47 +.57	12.2 +1.5	9.68 +.39	51.3 +1.0	55.60 +.67	49.8 +1.4
19.7	50.38 .95	15.1 1.1	38.02 .51	14.0 2.0	9.96 .27	52.6 1.5	56.24 .60	51.5 2.0
29.6	50.62 .93	16.3 1.4	38.49 .44	16.3 2.5	10.22 .25	54.3 1.8	56.80 .51	53.7 2.4
May 9.6	50.84 .91	17.8 1.6	38.89 .35	19.0 2.8	10.45 .22	56.3 2.1	57.27 .41	56.3 2.8
19.6	51.04 .18	19.5 1.8	39.20 .96	21.9 3.1	10.66 .19	58.5 2.3	57.63 .30	59.2 3.0
29.5	51.20 +.15	21.3 +1.8	39.41 +.16	25.1 +3.2	10.83 +.15	61.0 +2.5	57.87 +.19	62.4 +3.2
June 8.5	51.33 .12	23.2 1.9	39.52 +.06	28.4 3.3	10.96 .12	63.5 2.5	58.00 +.07	65.6 3.3
18.5	51.43 .08	25.1 1.8	39.53 -.04	31.7 3.3	11.06 .08	66.0 2.5	58.01 -.06	68.9 3.2
28.5	51.49 +.04	26.8 1.7	39.43 .15	34.9 3.1	11.11 +.03	68.5 2.4	57.89 .18	72.1 3.1
July 8.4	51.52 .00	28.5 1.6	39.24 .94	37.9 2.9	11.12 -.01	70.8 2.2	57.65 .99	75.1 2.9
18.4	51.50 -.04	30.0 +1.4	38.95 -.33	40.7 +2.6	11.09 -.05	72.9 +2.0	57.30 -.40	77.9 +2.6
28.4	51.45 .07	31.4 1.2	38.57 .42	43.1 2.2	11.02 .09	74.8 1.7	56.85 .50	80.4 2.3
Aug. 7.4	51.35 .11	32.5 1.0	38.12 .49	45.2 1.8	10.91 .13	76.4 1.4	56.30 .59	82.5 1.9
17.3	51.23 .14	33.3 0.7	37.59 .55	46.8 1.4	10.76 .16	77.7 1.1	55.68 .66	84.2 1.5
27.3	51.08 .16	34.0 0.5	37.02 .80	48.0 0.9	10.58 .19	78.6 0.8	54.99 .72	85.4 1.0
Sept. 6.3	50.91 -.17	34.3 +0.2	36.40 -.63	48.7 +0.4	10.39 -.20	79.2 +0.4	54.25 -.75	86.2 +0.5
16.2	50.73 .18	34.4 -0.1	35.76 .64	48.8 -0.1	10.17 .21	79.3 0.0	53.48 .77	86.4 0.0
26.2	50.55 .17	34.2 0.4	35.12 .64	48.4 0.6	9.96 .21	79.1 -0.4	52.70 .77	86.1 -0.5
Oct. 6.2	50.38 .17	33.7 0.6	34.48 .62	47.6 1.1	9.75 .20	78.5 0.8	51.93 .75	85.3 1.1
16.2	50.22 .15	32.9 0.9	33.88 .58	46.1 1.7	9.55 .18	77.5 1.2	51.20 .71	84.0 1.6
26.1	50.09 -.12	31.8 -1.2	33.33 -.52	44.2 -2.2	9.38 -.15	76.1 -1.6	50.52 -.64	82.1 -2.1
Nov. 5.1	49.99 .08	30.5 1.5	32.84 .45	41.8 2.6	9.25 .12	74.3 2.0	49.91 .56	79.8 2.5
15.1	49.93 -.03	28.9 1.7	32.44 .36	39.0 3.0	9.15 .07	72.2 2.3	49.40 .46	77.0 2.9
25.1	49.92 +.01	27.0 2.0	32.13 .25	35.8 3.3	9.10 -.02	69.8 2.6	49.00 .34	73.9 3.3
Dec. 5.0	49.96 .06	25.0 2.1	31.93 .14	32.4 3.6	9.10 +.03	67.1 2.8	48.72 .21	70.5 3.5
15.0	50.04 +.11	22.8 -2.2	31.85 -.02	28.7 -3.7	9.16 +.08	64.2 -2.9	48.58 -.07	66.9 -3.6
25.0	50.17 .15	20.5 2.3	31.88 +.09	25.0 3.7	9.26 .13	61.3 3.0	48.57 +.06	63.1 3.7
35.0	50.34 +.19	18.1 -2.3	32.03 +.21	21.3 -3.6	9.41 +.16	58.3 -2.9	48.71 +.20	59.4 -3.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ^2 Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	^h 17 54	^m +51° 29'	^h 17 58	^m -30° 25'	^h 18 7	^m -21° 5'	^h 18 15	^m - 2° 55'
Jan. 0.0	^s 0.50 +.13	64.1 -3.7	^s 41.65 +.19	27.7 +0.3	^s 8.46 +.17	12.7 -0.3	^s 34.67 +.14	36.6 -1.4
9.9	0.66 .19	60.5 3.5	41.86 .23	27.5 0.2	8.64 .21	13.0 0.3	34.83 .18	38.0 1.4
19.9	0.88 .25	57.1 3.2	42.11 .37	27.3 +0.1	8.87 .24	13.3 0.3	35.03 .21	39.3 1.3
29.9	1.16 .30	54.0 2.9	42.39 .29	27.3 0.0	9.12 .27	13.6 0.3	35.25 .23	40.6 1.2
Feb. 8.9	1.48 .34	51.4 2.4	42.70 .31	27.3 0.0	9.40 .29	14 0 0.3	35.50 .25	41.7 1.0
18.8	1.84 +.37	49.2 -1.9	43.02 +.33	27.3 0.0	9.70 +.30	14.3 -0.3	35.76 +.27	42.7 -0.8
28.8	2.22 .39	47.6 1.3	43.36 .34	27.4 -0.1	10.01 .31	14.5 0.2	36.04 .28	43.4 0.6
Mar. 10.8	2.62 .40	46.7 -0.6	43.70 .34	27.5 0.1	10.32 .32	14.7 -0.1	36.33 .29	43.8 -0.3
20.8	3.03 .40	46.4 0.0	44.05 .34	27.6 0.1	10.64 .32	14.8 0.0	36.62 .29	44.0 0.0
30.8	3.43 .39	46.7 +0.7	44.39 .34	27.7 0.1	10.96 .32	14.7 +0.1	36.91 .29	43.9 +0.2
Apr. 9.7	3.81 +.37	47.7 +1.3	44.73 +.33	27.8 -0.1	11.27 +.31	14.6 +0.1	37.20 +.29	43.6 +0.5
19.7	4.18 .35	49.2 1.8	45.06 .32	27.9 0.2	11.58 .30	14.5 0.2	37.49 .28	43.0 0.7
29.6	4.51 .31	51.3 2.3	45.37 .30	28.1 0.2	11.87 .28	14.3 0.2	37.76 .28	42.1 0.9
May 9.6	4.80 .27	53.8 2.6	45.66 .28	28.3 0.2	12.15 .27	14.0 0.2	38.02 .25	41.2 1.0
19.6	5.05 .22	56.6 2.9	45.93 .25	28.6 0.3	12.41 .24	13.8 0.2	38.25 .23	40.1 1.1
29.6	5.25 +.17	59.6 +3.1	46.17 +.22	28.9 -0.4	12.63 +.21	13.6 +0.2	38.47 +.20	38.9 +1.2
June 8.5	5.39 .11	62.6 3.2	46.37 .19	29.3 0.4	12.83 .18	13.4 0.1	38.65 .17	37.7 1.2
18.5	5.47 +.05	66.0 3.2	46.54 .14	29.7 0.5	13.00 .14	13.3 +0.1	38.80 .13	36.6 1.1
28.5	5.50 -0.1	69.1 3.1	46.66 .10	30.3 0.5	13.12 .10	13.2 0.0	38.92 .09	35.4 1.1
July 8.5	5.46 .07	72.1 2.9	46.74 .05	30.8 0.6	13.20 .06	13.2 0.0	38.99 .05	34.4 1.0
18.4	5.37 -0.12	74.9 +2.6	46.77 +0.1	31.4 -0.6	13.24 +0.2	13.3 -0.1	39.03 +0.1	33.5 +0.9
28.4	5.22 .18	77.4 2.3	46.76 -0.4	32.0 0.6	13.23 -0.2	13.4 0.1	39.02 -0.2	32.7 0.7
Aug. 7.4	5.01 .23	79.6 2.0	46.69 .03	32.6 0.5	13.18 .07	13.5 0.2	38.97 .07	32.0 0.6
17.3	4.76 .27	81.4 1.6	46.59 .12	33.1 0.5	13.09 .11	13.7 0.2	38.89 .10	31.5 0.4
27.3	4.47 .30	82.7 1.1	46.45 .15	33.6 0.4	12.97 .14	13.9 0.2	38.77 .13	31.2 0.3
Sept. 6.3	4.16 -0.33	83.6 +0.6	46.28 -0.18	33.9 -0.3	12.82 -0.16	14.1 -0.2	38.62 -0.15	30.9 +0.1
16.3	3.82 .34	84.0 +0.1	46.10 .19	34.1 0.2	12.65 .17	14.3 0.1	38.46 .17	30.9 0.0
26.2	3.47 .34	83.9 -0.4	45.90 .19	34.3 -0.1	12.47 .18	14.4 0.1	38.29 .17	30.9 -0.1
Oct. 6.2	3.13 .33	83.3 0.9	45.71 .18	34.2 +0.1	12.29 .17	14.4 -0.1	38.12 .17	31.1 0.3
16.2	2.81 .31	82.2 1.4	45.54 .16	34.0 0.2	12.13 .15	14.5 0.0	37.96 .15	31.5 0.4
26.2	2.51 -0.28	80.5 -1.9	45.30 -0.13	33.8 +0.3	11.99 -0.13	14.5 0.0	37.82 -0.13	32.0 -0.6
Nov. 5.1	2.25 .23	78.4 2.3	45.27 .09	33.4 0.4	11.88 .09	14.5 0.0	37.70 .10	32.7 0.7
15.1	2.05 .18	75.9 2.7	45.20 -0.04	33.0 0.5	11.81 -0.05	14.5 0.0	37.63 .06	33.5 0.9
25.1	1.90 .19	73 0 3.1	45.18 +0.1	32.5 0.5	11.78 .00	14.5 -0.1	37.59 -0.01	34.5 1.0
Dec. 5.0	1.82 -0.05	69.7 3.3	45.22 .06	32.0 0.4	11.81 +0.05	14.6 0.1	37.60 +0.03	35.5 1.2
15.0	1.80 +0.02	66.2 -3.5	45.31 +0.11	31.6 +0.4	11.88 +0.10	14.8 -0.2	37.65 +0.07	36.8 -1.2
25.0	1.86 .09	62.7 3.6	45.45 .16	31.3 0.3	12.01 .14	15.0 0.2	37.75 .12	38.1 1.3
35.0	1.98 +0.15	59.1 -3.7	45.64 +0.21	31.0 +0.3	12.17 +0.19	15.2 -0.3	37.89 +0.16	39.4 -1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	I Aquilæ.		α Lyræ. (Vega.)		σ Octantis.		β Lyræ.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	^h ^m 18 29	— 8° 19'	^h ^m 18 33	+38° 40'	^h 18	—89° 15'	^h ^m 18 45	+33° 13'
Jan. 0.0	^s 10.81 +.13	["] 15.2 —1.0	^s 10.46 +.08	["] 51.8 —3.9	^m ^s 40 0.8+ 4.3	["] 61.9 +3.3	^s 58.78 +.08	["] 65.3 —3.0
10.0	10.96 .17	16.2 1.0	10.57 .13	48.6 3.9	40 6.8 7.5	58.7 3.2	58.88 .18	62.2 3.0
19.9	11.15 .20	17.2 0.9	10.73 .18	45.5 3.0	40 15.8 10.4	55.6 3.0	59.03 .17	59.3 2.9
29.9	11.37 .23	18.1 0.9	10.91 .22	42.5 2.8	40 27.7 13.0	52.7 2.7	59.21 .21	56.5 2.7
Feb. 8.9	11.61 .23	18.9 0.8	11.18 .26	39.9 2.4	40 41.9 15.3	50.1 2.4	59.44 .24	54.0 2.3
18.8	11.87 +.27	19.6 —0.6	11.46 +.29	37.7 —2.0	40 58.2+17.1	48.0 +2.0	59.69 +.27	51.8 —1.9
28.8	12.15 .28	20.1 0.4	11.76 .31	36.0 1.5	41 16.1 18.5	46.2 1.5	59.97 .29	50.1 1.4
Mar. 10.8	12.44 .29	20.4 —0.2	12.08 .33	34.8 0.9	41 35.2 19.4	44.9 1.1	60.27 .31	48.9 0.9
20.8	12.73 .30	20.5 0.0	12.41 .34	34.2 —0.3	41 55.0 20.0	44.1 0.8	60.58 .32	48.3 —0.3
30.7	13.03 .30	20.3 +0.3	12.75 .34	34.2 +0.3	42 15.2 20.1	43.7 +0.1	60.90 .32	48.2 +0.2
Apr. 9.7	13.33 +.30	20.0 +0.5	13.08 +.33	34.8 +0.9	42 35.2+19.8	43.9 —0.4	61.23 +.30	48.7 +0.8
19.7	13.62 .29	19.4 0.6	13.41 .32	36.0 1.4	42 54.8 19.1	44.5 0.9	61.54 .31	49.8 1.3
29.7	13.91 .28	18.7 0.8	13.72 .30	37.6 1.9	43 13.4 18.0	45.6 1.3	61.85 .30	51.3 1.7
May 9.6	14.18 .26	17.9 0.9	14.01 .28	39.7 2.3	43 30.8 16.6	47.1 1.7	62.13 .27	53.2 2.1
19.6	14.43 .24	16.9 1.0	14.27 .24	42.2 2.6	43 46 6 14.8	49.1 2.1	62.40 .25	55.5 2.4
29.6	14.66 +.21	15.9 +1.0	14.50 +.21	44.9 +2.8	44 0.1+19.6	51.4 —2.5	62.63 +.22	58.1 +2.6
June 8.5	14.86 .18	15.0 0.9	14.69 .17	47.8 2.9	44 11.8 10.2	54.0 2.7	62.83 .18	60.8 2.8
18.5	15.03 .15	14.1 0.9	14.83 .19	50.8 3.0	44 20.8 7.6	56.8 2.9	62.99 .14	63.7 2.8
28.5	15.16 .11	13.2 0.8	14.93 .07	53.8 2.9	44 27.0 4.7	59.9 3.1	63.10 .09	66.5 2.8
July 8.5	15.26 .07	12.4 0.7	14.98 +.08	56.7 2.8	44 30.2+ 1.8	63.0 3.1	63.17 +.04	69.3 2.7
18.4	15.31 +.03	11.7 +0.6	14.97 —.03	59.5 +2.7	44 30.5— 1.3	66.1 —3.1	63.19 .00	72.0 +2.6
28.4	15.32 —.01	11.2 0.5	14.92 .08	62.0 2.4	44 27.7 4.2	69.1 3.0	63.16 —.05	74.5 2.4
Aug. 7.4	15.28 .05	10.8 0.4	14.82 .19	64.3 2.1	44 22.0 7.1	72.0 2.7	63.09 .10	76.7 2.1
17.4	15.21 .09	10.4 0.3	14.67 .17	66.3 1.8	44 13.5 9.7	74.6 2.4	62.97 .14	78.6 1.8
27.3	15.10 .12	10.2 0.2	14.48 .20	67.9 1.4	44 2.6 12.0	76.8 2.0	62.81 .17	80.2 1.4
Sept. 6.3	14.96 —.15	10.1 +0.1	14.27 —.23	69.1 +1.0	43 49.6—13.8	78.6 —1.5	62.63 —.20	81.4 +1.0
16.3	14.81 .16	10.1 0.0	14.03 .25	69.9 0.6	43 34.9 15.2	79.9 1.0	62.41 .22	82.3 0.6
26.2	14.64 .17	10.2 —0.1	13.77 .26	70.3 +0.1	43 19.2 15.9	80.6 —0.4	62.18 .23	82.7 +0.2
Oct. 6.2	14.47 .17	10.4 0.2	13.51 .25	70.2 —0.3	43 3.0 16.1	80.8 +0.2	61.95 .23	82.7 —0.2
16.2	14.31 .15	10.7 0.3	13.26 .24	69.6 0.8	42 47.0 15.6	80.3 0.8	61.72 .22	82.3 0.7
26.2	14.16 —.13	11.0 —0.4	13.03 —.22	68.5 —1.3	42 31.9—14.4	79.2 +1.4	61.51 —.20	81.4 —1.1
Nov. 5.1	14.04 .10	11.5 0.5	12.82 .19	67.0 1.7	42 18.3 12.6	77.6 1.9	61.32 .17	80.1 1.5
15.1	13.96 .06	12.1 0.6	12.65 .15	65.1 2.1	42 6.7 10.3	75.4 2.4	61.16 .14	78.3 1.9
25.1	13.91 —.02	12.8 0.7	12.53 .10	62.8 2.5	41 57.2 7.5	72.8 2.8	61.04 .10	76.2 2.3
Dec. 5.1	13.92 +.02	13.5 0.8	12.45 —.05	60.1 2.8	41 51.7 4.4	69.9 3.1	60.96 —.05	73.8 2.6
15.0	13.96 +.07	14.4 —0.9	12.42 .00	57.2 —3.0	41 49.0— 1.1	66.7 +3.2	60.94 .00	71.1 —2.8
25.0	14.05 .11	15.3 0.9	12.45 +.06	54.0 3.2	41 49.5+ 2.2	63.4 3.3	60.96 +.05	68.2 2.9
35.0	14.19 +.15	16.3 —1.0	12.51 +.11	50.8 —3.2	41 53.4+ 5.6	60.1 +3.3	61.04 +.10	65.2 —3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		δ Sagittarii.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 18 ^m 48	[°] —26 ['] 25	^h 18 ^m 49	[°] +75 ['] 17	^h 19 ^m 0	[°] +13 ['] 41	^h 19 ^m 11	[°] —19 ['] 8
Jan. 0.0	^s 23.90 +.13	["] 60.0 +0.2	^s 50.38 —.10	["] 74.2 —3.5	^s 18.96 +.08	["] 59.5 —2.1	^s 9.32 +.10	["] 56.5 —0.2
10.0	24.06 .17	59.8 .2	50.37 +.07	70.6 3.5	19.06 .12	57.3 2.1	9.44 .14	56.7 .2
20.0	24.25 .21	59.6 .2	50.52 .23	67.0 3.5	19.20 .16	55.2 2.0	9.60 .18	56.9 .1
29.9	24.48 .24	59.4 .2	50.84 .39	63.6 3.3	19.37 .19	53.2 1.9	9.80 .21	57.0 —0.1
Feb. 8.9	24.73 .27	59.2 .2	51.30 .53	60.4 2.9	19.58 .22	51.5 1.7	10.02 .24	57.0 0.0
18.9	25.01 +.29	59.0 +0.2	51.90 +.65	57.7 —2.5	19.81 +.24	49.9 —1.4	10.27 +.26	57.0 +0.1
28.8	25.31 .31	58.7 .2	52.60 .75	55.5 1.9	20.06 .26	48.8 1.0	10.54 .28	56.9 .2
Mar. 10.8	25.63 .32	58.5 .3	53.40 .82	53.9 1.3	20.33 .27	48.0 0.6	10.82 .29	56.7 .3
20.8	25.95 .33	58.2 .3	54.24 .86	52.9 —0.7	20.61 .28	47.6 —0.2	11.12 .30	56.4 .4
30.8	26.23 .33	57.8 .4	55.12 .88	52.5 0.0	20.90 .29	47.6 +0.2	11.43 .31	55.9 .5
Apr. 9.7	26.62 +.33	57.5 +0.4	56.00 +.86	52.8 +0.6	21.19 +.29	48.1 +0.7	11.74 +.32	55.4 +0.6
19.7	26.95 .33	57.1 .4	56.84 .82	53.8 1.2	21.49 .29	49.0 1.1	12.06 .32	54.7 .7
29.7	27.27 .32	56.7 .3	57.63 .75	55.3 1.8	21.77 .28	50.2 1.4	12.38 .31	54.0 .7
May 9.7	27.59 .30	56.4 .3	58.34 .66	57.3 2.3	22.05 .27	51.7 1.7	12.68 .30	53.3 .7
19.6	27.88 .28	56.1 .2	58.94 .54	59.8 2.7	22.31 .25	53.5 1.9	12.98 .28	52.6 .7
29.6	28.15 +.26	55.9 +0.2	59.42 +.42	62.7 +3.0	22.55 +.23	55.5 +2.0	13.25 +.26	51.9 +0.6
June 8.6	28.40 .23	55.8 +0.1	59.78 .28	65.8 3.2	22.76 .20	57.5 2.1	13.50 .23	51.3 .6
18.5	28.61 .19	55.8 —0.1	59.99 +.14	69.1 3.3	22.94 .16	59.7 2.1	13.72 .20	50.8 .5
28.5	28.78 .15	55.9 .2	60.05 —.01	72.5 3.4	23.08 .12	61.8 2.1	13.90 .16	50.4 .4
July 8.5	28.90 .10	56.1 .3	59.97 .16	75.8 3.3	23.19 .08	63.8 2.0	14.04 .12	50.1 .2
18.5	28.98 +.06	56.4 —0.4	59.73 —.30	79.1 +3.2	23.25 +.04	65.7 +1.8	14.14 +.07	49.9 +0.1
28.4	29.02 +.01	56.8 .4	59.36 .44	82.2 3.0	23.26 —.01	67.5 1.7	14.19 +.03	49.9 0.0
Aug. 7.4	29.00 —.04	57.3 .5	58.86 .56	85.0 2.7	23.24 .05	69.1 1.5	14.20 —.02	49.9 —0.1
17.4	28.94 .06	57.8 .5	58.23 .68	87.5 2.3	23.17 .09	70.4 1.9	14.16 .06	50.1 .2
27.4	28.84 .12	58.3 .5	57.50 .77	89.6 1.9	23.06 .12	71.5 1.0	14.07 .10	50.3 .3
Sept. 6.3	28.70 —.15	58.7 —0.4	56.69 —.85	91.4 +1.5	22.93 —.15	72.3 +0.7	13.96 —.13	50.6 —0.3
16.3	28.54 .17	59.2 .4	55.80 .91	92.7 1.0	22.77 .17	72.9 0.4	13.81 .15	50.9 .3
26.3	28.36 .18	59.5 .3	54.87 .94	93.5 +0.5	22.59 .18	73.2 +0.1	13.65 .17	51.2 .3
Oct. 6.2	28.17 .18	59.7 .2	53.92 .95	93.7 0.0	22.41 .18	73.1 —0.2	13.48 .17	51.5 .3
16.2	27.99 .17	59.9 —0.1	52.96 .94	93.5 —0.5	22.23 .17	72.8 0.5	13.30 .17	51.8 .3
26.2	27.83 —.15	59.9 0.0	52.03 —.20	92.7 —1.1	22.06 —.16	72.2 —0.8	13.14 —.15	52.0 —0.2
Nov. 5.2	27.60 .12	59.9 +0.1	51.16 .84	91.3 1.6	21.91 .13	71.3 1.1	13.00 .12	52.2 .2
15.1	27.50 .08	59.8 .2	50.36 .75	89.5 2.1	21.79 .10	70.1 1.3	12.90 .09	52.4 .2
25.1	27.53 —.04	59.6 .2	49.66 .64	87.2 2.6	21.71 .06	68.6 1.6	12.82 .05	52.6 .2
Dec. 5.1	27.52 +.01	59.4 .2	49.09 .51	84.4 2.9	21.66 —.02	67.0 1.8	12.79 —.01	52.8 .2
15.1	27.55 +.06	59.1 +0.2	48.65 —.36	81.3 —3.3	21.66 +.02	65.1 —2.0	12.80 +.03	52.9 —0.2
25.0	27.64 .11	58.9 .2	48.37 .20	77.9 3.5	21.70 .06	63.0 2.1	12.86 .08	53.1 .2
35.0	27.77 +.16	58.7 +0.2	48.25 —.04	74.3 —3.6	21.78 +.10	60.9 —2.1	12.96 +.12	53.3 —0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 19 12	^m +67° 27'	^h 19 17	^m +73° 8'	^h 19 19	^m + 2° 53'	^h 19 30	^m - 7° 16'
Jan. 0.0	28.27 -.08	65.9 -3.5	35.82 -.16	65.4 -3.5	54.79 +.07	42.6 -1.4	55.99 +.07	21.1 -0.9
10.0	28.24 +.03	62.4 3.6	35.73 .00	61.9 3.6	54.88 .11	41.1 1.5	56.08 .11	21.9 0.8
20.0	28.33 .14	58.8 3.5	35.79 +.13	58.3 3.5	55.01 .15	39.6 1.4	56.21 .14	22.8 0.8
29.9	28.52 .34	55.3 3.4	35.99 .37	54.8 3.4	55.17 .18	38.2 1.3	56.37 .17	23.5 0.7
Feb. 8.9	28.81 .33	52.1 3.1	36.32 .40	51.5 3.1	55.37 .21	37.0 1.1	56.56 .20	24.2 0.6
18.9	29.19 +.42	49.2 -2.6	36.78 +.51	48.6 -2.7	55.59 +.23	36.0 -0.9	56.78 +.23	24.6 -0.4
28.9	29.64 .49	46.8 2.1	37.34 .61	46.1 2.2	55.83 .25	35.2 0.6	57.01 .25	24.9 -0.2
Mar. 10.8	30.16 .54	44.9 1.6	37.99 .69	44.2 1.6	56.08 .27	34.8 -0.3	57.27 .27	25.0 0.0
20.8	30.73 .56	43.7 0.9	38.71 .74	42.8 1.0	56.36 .28	34.6 0.0	57.55 .28	24.9 +0.3
30.8	31.32 .00	43.1 -0.3	39.47 .77	42.2 -0.4	56.64 .29	34.8 +0.3	57.83 .29	24.5 0.5
Apr. 9.7	31.93 +.09	43.2 +0.4	40.24 +.77	42.1 +0.3	56.93 +.29	35.3 +0.7	58.13 +.30	23.9 +0.7
19.7	32.52 .58	43.9 1.0	41.01 .75	42.7 0.9	57.23 .29	36.1 1.0	58.43 .30	23.1 0.9
29.7	33.10 .55	45.2 1.6	41.74 .70	43.9 1.5	57.52 .30	37.2 1.2	58.73 .30	22.1 1.1
May 9.7	33.62 .50	47.1 2.1	42.42 .64	45.7 2.0	57.81 .28	38.5 1.4	59.03 .29	21.0 1.2
19.6	34.10 .44	49.5 2.6	43.02 .55	48.0 2.5	58.08 .27	40.0 1.5	59.31 .28	19.8 1.2
29.6	34.50 +.36	52.2 +2.9	43.52 +.45	50.7 +2.9	58.34 +.24	41.6 +1.6	59.58 +.26	18.5 +1.3
June 8.6	34.82 .28	55.3 3.2	43.92 .34	53.7 3.1	58.57 .23	43.3 1.7	59.83 .23	17.3 1.2
18.6	35.06 .19	58.6 3.4	44.21 .28	57.0 3.3	58.77 .19	45.0 1.7	60.05 .20	16.0 1.2
28.5	35.19 +.09	62.0 3.4	44.36 +.09	60.4 3.4	58.94 .15	46.6 1.6	60.24 .17	14.9 1.1
July 8.5	35.23 -0.1	65.5 3.4	44.39 -0.4	63.8 3.4	59.07 .11	48.2 1.5	60.39 .13	13.8 1.0
18.5	35.17 -1.1	68.9 +3.3	44.29 -1.7	67.2 +3.3	59.16 +.07	49.6 +1.4	60.49 +.08	12.9 +0.8
28.4	35.02 .20	72.1 3.1	44.06 .20	70.5 3.2	59.20 +.09	50.9 1.2	60.55 +.04	12.2 0.7
Aug. 7.4	34.77 .30	75.2 2.9	43.70 .41	73.6 3.0	59.20 -0.02	52.0 1.0	60.57 .00	11.5 0.5
17.4	34.43 .38	77.9 2.6	43.24 .58	76.4 2.7	59.16 .06	53.0 0.8	60.55 -0.05	11.1 0.4
27.4	34.01 .45	80.3 2.2	42.67 .61	78.9 2.3	59.03 .10	53.7 0.6	60.48 .00	10.8 0.2
Sept. 6.3	33.53 -51	82.4 +1.8	42.02 -0.00	81.0 +1.9	58.97 -1.13	54.3 +0.4	60.38 -1.12	10.6 +0.1
16.3	32.99 .56	83.9 1.3	41.29 .75	82.7 1.5	58.83 .15	54.6 +0.2	60.25 .14	10.6 0.0
26.3	32.41 .59	85.0 0.8	40.51 .80	83.9 1.0	58.67 .16	54.7 0.0	60.09 .16	10.7 -0.1
Oct. 6.3	31.82 .60	85.6 +0.3	39.70 .89	84.6 +0.5	58.51 .17	54.7 -0.2	59.93 .16	10.9 0.2
16.2	31.21 .60	85.7 -0.2	38.88 .88	84.8 -0.1	58.34 .16	54.4 0.3	59.77 .16	11.2 0.3
26.2	30.62 -56	85.2 -0.8	38.06 -0.80	84.4 -0.6	58.18 -1.15	54.0 -0.5	59.61 -1.15	11.5 -0.4
Nov. 5.2	30.05 .54	84.1 1.3	37.28 .75	83.5 1.2	58.14 .13	53.3 0.7	59.47 .13	12.0 0.5
15.1	29.53 .49	82.5 1.8	36.56 .80	82.1 1.7	57.92 .10	52.5 0.9	59.35 .10	12.6 0.6
25.1	29.08 .42	80.4 2.3	35.90 .80	80.1 2.2	57.84 .07	51.5 1.1	59.27 .07	13.2 0.7
Dec. 5.1	28.70 .34	77.9 2.8	35.35 .50	77.6 2.7	57.79 -0.03	50.3 1.2	59.22 -0.03	13.9 0.7
15.1	28.40 -34	74.9 -3.1	34.91 -3.38	74.7 -3.0	57.78 +0.01	49.0 -1.3	59.21 +0.01	14.7 -0.8
25.0	28.21 .14	71.6 3.4	34.59 .25	71.5 3.3	57.82 .05	47.6 1.4	59.24 .05	15.5 0.8
35.0	28.12 -04	68.1 -3.5	34.41 -1.11	68.1 -3.5	57.89 +0.00	46.2 -1.4	59.31 +0.00	16.3 -0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (<i>Altair</i> .)		ϵ Draconis.		β Aquilæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 19 ^m 40	+ 10° 20'	^h 19 ^m 45	+ 8° 34'	^h 19 ^m 48	+ 69° 58'	^h 19 ^m 49	+ 6° 7'
Jan. 0.0	59.53 +.05	41.6 -1.8	22.71 +.05	38.6 -1.7	28.80 -.90	79.0 -3.3	52.32 +.04	53.3 -1.6
10.0	59.60 .08	39.8 1.8	22.78 .08	36.9 1.7	28.66 -.08	75.6 3.5	52.38 .08	51.8 1.6
20.0	59.70 .12	37.9 1.8	22.88 .12	35.3 1.6	28.64 +.04	72.1 3.5	52.48 .12	50.2 1.5
30.0	59.84 .15	36.2 1.7	23.01 .15	33.6 1.5	28.74 .16	68.6 3.4	52.61 .15	48.7 1.4
Feb. 8.9	60.01 .18	34.6 1.5	23.18 .18	32.2 1.4	28.95 .27	65.2 3.2	52.78 .18	47.4 1.2
18.9	60.21 +.21	33.3 -1.2	23.37 +.21	30.9 -1.1	29.28 +.37	62.1 -2.9	52.97 +.20	46.2 -1.0
28.9	60.43 .23	32.2 0.9	23.59 .23	30.0 0.8	29.70 .47	59.4 2.5	53.18 .23	45.4 0.7
Mar. 10.9	60.67 .25	31.5 0.5	23.84 .25	29.3 0.5	30.21 .54	57.2 2.0	53.42 .25	44.8 0.4
20.8	60.94 .27	31.2 -0.2	24.10 .27	29.0 -0.1	30.79 .60	55.5 1.4	53.68 .27	44.6 -0.1
30.8	61.21 .28	31.2 +0.2	24.37 .28	29.1 +0.2	31.42 .64	54.5 0.7	53.95 .28	44.7 +0.2
Apr. 9.8	61.50 +.29	31.7 +0.6	24.66 +.29	29.6 +0.6	32.08 +.66	54.1 -0.1	54.24 +.29	45.1 +0.6
19.7	61.80 .30	32.5 1.0	24.96 .30	30.4 1.0	32.74 .66	54.3 +0.6	54.53 .30	45.9 1.0
29.7	62.09 .29	33.6 1.3	25.26 .30	31.6 1.3	33.40 .64	55.2 1.2	54.83 .30	47.1 1.3
May 9.7	62.39 .29	35.0 1.6	25.55 .29	33.0 1.6	34.02 .60	56.7 1.7	55.13 .29	48.4 1.5
19.7	62.67 .27	36.7 1.8	25.83 .28	34.7 1.8	34.60 .54	58.7 2.2	55.41 .28	50.0 1.7
29.6	62.93 +.25	38.6 +1.9	26.10 +.26	36.5 +1.9	35.11 +.47	61.2 +2.7	55.68 +.26	51.8 +1.9
June 5.6	63.18 .23	40.6 2.0	26.35 .23	38.5 2.0	35.53 .38	64.0 3.0	55.93 .24	53.6 1.9
18.6	63.39 .20	42.7 2.1	26.57 .20	40.5 2.0	35.87 .28	67.2 3.2	56.16 .21	55.5 1.9
28.6	63.57 .16	44.7 2.0	26.76 .17	42.4 1.9	36.10 .18	70.6 3.4	56.35 .17	57.4 1.8
July 8.5	63.72 .12	46.7 1.9	26.91 .13	44.4 1.9	36.23 +.07	74.1 3.5	56.50 .13	59.2 1.7
18.5	63.82 +.08	48.6 +1.8	27.01 +.09	46.2 +1.8	36.24 -.04	77.6 +3.5	56.62 +.09	60.9 +1.6
28.5	63.87 +.04	50.4 1.7	27.08 +.04	47.9 1.6	36.15 .15	81.0 3.4	56.68 +.05	62.4 1.5
Aug. 7.4	63.89 -.01	52.0 1.5	27.10 .00	49.4 1.4	35.95 .25	84.3 3.2	56.71 .00	63.8 1.3
17.4	63.85 .05	53.3 1.3	27.07 -.04	50.7 1.2	35.64 .35	87.4 3.0	56.69 -.04	65.0 1.1
27.4	63.78 .09	54.5 1.0	27.01 .06	51.8 1.0	35.25 .44	90.2 2.7	56.63 .06	65.9 0.8
Sept. 6.4	63.68 -.12	55.4 +0.8	26.91 -.11	52.6 +0.7	34.76 -.52	92.7 +2.3	56.53 -.11	66.7 +0.6
16.3	63.54 .15	56.0 0.5	26.78 .14	53.2 0.5	34.21 .58	94.8 1.9	56.41 .14	67.2 0.4
26.3	63.39 .16	56.4 +0.2	26.63 .16	53.6 +0.2	33.60 .63	96.5 1.4	56.26 .16	67.5 +0.2
Oct. 6.3	63.22 .17	56.5 0.0	26.46 .17	53.7 0.0	32.95 .66	97.6 0.9	56.10 .16	67.5 -0.1
16.3	63.04 .17	56.4 -0.2	26.29 .17	53.6 -0.2	32.28 .67	98.2 +0.4	55.93 .16	67.4 0.2
26.2	62.88 -.16	56.0 -0.5	26.13 -.16	53.2 -0.5	31.61 -.67	98.4 -0.2	55.77 -.16	67.0 -0.5
Nov. 5.2	62.72 .14	55.3 0.8	25.98 .14	52.6 0.7	30.95 .64	97.9 0.7	55.62 .14	66.4 0.7
15.2	62.59 .12	54.4 1.0	25.84 .12	51.7 1.0	30.32 .60	96.9 1.3	55.48 .12	65.6 0.9
25.1	62.49 .09	53.2 1.3	25.74 .08	50.7 1.2	29.75 .54	95.3 1.8	55.38 .08	64.6 1.1
Dec. 5.1	62.42 .05	51.9 1.5	25.68 .05	49.4 1.4	29.25 .46	93.2 2.3	55.32 .05	63.4 1.3
15.1	62.39 -.01	50.3 -1.6	25.64 -.01	47.9 -1.5	28.83 -.37	90.6 -2.8	55.28 -.01	62.0 -1.4
25.1	62.39 +.03	48.6 1.7	25.65 +.03	46.4 1.6	28.51 .27	87.6 3.1	55.29 +.03	60.5 1.5
35.0	62.44 +.07	46.8 -1.8	25.70 +.06	44.7 -1.6	28.30 -.15	84.4 -3.3	55.33 +.06	59.0 -1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α^1 Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h ^m 19 58	+ 6° 57'	^h ^m 20 11	—12° 53'	^h ^m 20 12	+77° 22'	^h ^m 20 16	—57° 4'
Jan. 0.1	43.77 +.03	61.1 —1.6	54.69 +.04	13.3 —0.4	30.03 —.48	52.3 —3.1	53.07 +.02	82.9 +2.1
10.0	43.82 .07	59.5 1.6	54.74 .07	13.7 0.4	29.65 .29	49.1 3.3	53.12 .09	80.7 2.2
20.0	43.91 .10	57.9 1.5	54.83 .11	14.0 0.3	29.44 —.11	45.7 3.4	53.25 .16	78.4 2.3
30.0	44.03 .14	56.4 1.4	54.96 .14	14.3 0.2	29.43 +.08	42.2 3.4	53.44 .22	76.1 2.4
Feb. 0.0	44.19 .17	55.1 1.3	55.11 .17	14.4 —0.1	29.61 .27	38.8 3.3	53.69 .28	73.7 2.3
18.9	44.37 +.20	53.9 —1.0	55.30 +.20	14.5 0.0	29.97 +.45	35.6 —3.1	54.00 +.23	71.4 +2.2
28.9	44.58 .22	53.0 0.7	55.51 .22	14.3 +0.2	30.50 .21	32.7 2.7	54.35 .22	69.2 2.1
Mar. 10.9	44.81 .24	52.5 0.4	55.75 .25	14.1 0.4	31.19 .74	30.2 2.2	54.75 .22	67.2 2.0
20.8	45.06 .26	52.2 —0.1	56.01 .27	13.6 0.6	31.99 .25	28.2 1.7	55.19 .25	65.3 1.8
30.8	45.34 .28	52.3 +0.3	56.28 .28	12.9 0.8	32.90 .24	26.8 1.1	55.66 .26	63.6 1.5
Apr. 9.8	45.62 +.29	52.8 +0.6	56.57 +.30	12.1 +0.9	33.86 +.28	26.1 —0.5	56.16 +.29	62.2 +1.3
19.8	45.91 .30	53.6 1.0	56.86 .31	11.1 1.1	34.86 1.00	25.9 +0.2	56.68 .22	61.0 1.0
29.7	46.21 .30	54.8 1.3	57.19 .31	9.9 1.2	35.86 .28	26.4 0.8	57.20 .23	60.2 0.7
May 9.7	46.51 .29	56.2 1.5	57.50 .31	8.7 1.2	36.82 .23	27.5 1.4	57.73 .22	59.7 +0.4
19.7	46.80 .28	57.8 1.7	57.81 .30	7.5 1.2	37.71 .26	29.2 1.9	58.24 .21	59.5 0.6
29.7	47.07 +.27	59.6 +1.8	58.11 +.29	6.3 +1.2	38.51 +.74	31.4 +2.4	58.74 +.28	59.7 —0.4
June 8.6	47.33 .24	61.5 1.9	58.39 .27	5.0 1.2	39.19 .21	34.0 2.8	59.21 .25	60.2 0.7
18.6	47.56 .21	63.4 1.9	58.65 .24	3.9 1.1	39.73 .47	37.0 3.1	59.63 .20	61.1 1.0
28.6	47.76 .18	65.4 1.9	58.87 .21	2.9 0.9	40.12 .31	40.2 3.3	60.01 .24	62.2 1.3
July 8.5	47.92 .14	67.2 1.8	59.06 .17	2.0 0.8	40.35 +.15	43.6 3.4	60.32 .28	63.7 1.6
18.5	48.04 +.10	69.0 +1.7	59.21 +.13	1.3 +0.6	40.42 —.02	47.1 +3.5	60.56 +.21	65.4 —1.8
28.5	48.11 .05	70.6 1.5	59.31 .08	0.7 0.5	40.31 .19	50.6 3.5	60.73 .13	67.3 2.0
Aug. 7.5	48.15 +.01	72.0 1.4	59.37 +.04	0.4 0.3	40.04 .25	54.0 3.4	60.82 +.05	69.4 2.1
17.4	48.13 —.03	73.4 1.3	59.38 —.01	0.2 +0.1	39.61 .20	57.3 3.2	60.83 —.03	71.4 2.1
27.4	48.08 .07	74.4 0.9	59.35 .05	0.1 0.0	39.03 .25	60.4 2.9	60.77 .10	73.5 2.0
Sept. 6.4	47.99 —.10	75.2 +0.7	59.28 —.09	0.2 —0.1	38.32 —.77	63.2 +2.6	60.63 —.17	75.5 —1.9
16.4	47.87 .13	75.8 0.5	59.18 .19	0.3 0.2	37.48 .28	65.6 2.2	60.43 .23	77.2 1.7
26.3	47.73 .15	76.2 +0.3	59.04 .14	0.6 0.3	36.55 .27	67.7 1.8	60.18 .27	78.8 1.4
Oct. 6.3	47.57 .16	76.3 0.0	58.89 .15	0.9 0.4	35.55 1.03	69.3 1.3	59.89 .20	80.0 1.0
16.3	47.40 .16	76.2 —0.2	58.73 .16	1.3 0.4	34.49 1.07	70.4 0.8	59.58 .21	80.8 0.6
26.2	47.24 —.16	75.8 —0.5	58.58 —.15	1.7 —0.4	33.40 —1.08	71.0 +0.3	59.27 —.21	81.2 —0.2
Nov. 5.2	47.08 .14	75.3 0.7	58.43 .14	2.2 0.4	32.32 1.07	71.0 —0.3	58.96 .29	81.2 +0.2
15.2	46.95 .12	74.5 0.9	58.30 .12	2.6 0.5	31.26 1.03	70.4 0.8	58.69 .25	80.8 0.6
25.2	46.84 .09	73.5 1.1	58.19 .09	3.1 0.5	30.27 .25	69.3 1.4	58.46 .21	80.0 1.0
Dec. 5.1	46.77 .06	72.3 1.3	58.12 .06	3.6 0.5	29.36 .25	67.6 1.9	58.28 .18	78.7 1.4
15.1	46.73 —.02	71.0 —1.4	58.08 —.02	4.0 —0.4	28.57 —.73	65.4 —2.4	58.16 —.09	77.2 +1.7
25.1	46.72 +.01	69.5 1.5	58.08 +.02	4.4 0.4	27.91 .28	62.8 2.8	58.11 —.02	75.3 2.0
35.1	46.76 +.05	68.0 —1.6	58.12 +.05	4.9 —0.4	27.41 —.41	59.8 —3.2	58.12 +.02	73.2 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ϵ Delphini.		Groombridge 3241.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 20 ^m 18	+39° 53'	^h 20 ^m 20	−18° 34'	^h 20 ^m 27	+10° 55'	^h 20 ^m 30	+72° 9'
Jan. 0.1	14.64 −.05	78.4 −2.8	59.06 +.03	26.1 −0.1	55.31 .00	44.4 −1.7	24.92 −.35	37.6 −3.6
10.0	14.62 .00	75.6 2.9	59.11 .07	26.1 0.0	55.34 +.04	42.8 1.7	24.63 .32	34.5 3.2
20.0	14.65 +.05	72.6 3.0	59.20 .10	26.1 +0.1	55.39 .07	41.1 1.7	24.47 −.10	31.2 3.4
30.0	14.72 .10	69.6 3.0	59.32 .14	26.0 0.2	55.48 .11	39.4 1.6	24.43 +.03	27.7 3.4
Feb. 9.0	14.85 .14	66.8 2.7	59.47 .17	25.8 0.3	55.60 .14	37.9 1.4	24.53 .16	24.3 3.3
18.9	15.01 +.19	64.2 −2.4	59.65 +.20	25.5 +0.4	55.76 +.17	36.6 −1.2	24.76 +.22	21.0 −3.1
28.9	15.22 .23	61.9 2.0	59.87 .22	25.0 0.5	55.94 .20	35.5 0.9	25.11 .41	18.0 2.8
Mar. 10.9	15.46 .26	60.1 1.6	60.10 .25	24.4 0.7	56.15 .22	34.8 0.6	25.57 .51	15.4 2.4
20.9	15.74 .29	58.7 1.1	60.36 .27	23.7 0.8	56.39 .25	34.4 −0.2	26.13 .80	13.3 1.8
30.8	16.05 .32	57.9 −0.5	60.64 .29	22.8 0.9	56.64 .27	34.4 +0.2	26.77 .86	11.8 1.2
Apr. 9.8	16.38 +.33	57.7 0.0	60.94 +.30	21.8 +1.0	56.92 +.28	34.7 +0.6	27.46 +.71	10.8 −0.6
19.8	16.72 .34	58.0 +0.6	61.25 .31	20.7 1.1	57.21 .29	35.5 0.9	28.19 .73	10.5 0.0
29.7	17.07 .35	58.9 1.2	61.57 .32	19.5 1.2	57.51 .30	36.6 1.3	28.92 .73	10.9 +0.7
May 9.7	17.41 .34	60.3 1.7	61.89 .32	18.4 1.2	57.81 .30	38.0 1.6	29.65 .71	11.9 1.3
19.7	17.75 .33	62.2 2.1	62.21 .32	17.2 1.1	58.11 .29	39.7 1.8	30.33 .66	13.4 1.8
29.7	18.07 +.30	64.5 +2.5	62.53 +.30	16.1 +1.1	58.40 +.28	41.6 +2.0	30.97 +.60	15.5 +2.3
June 8.6	18.36 .27	67.1 2.8	62.82 .28	15.0 1.0	58.67 .26	43.6 2.1	31.52 .51	18.0 2.7
18.6	18.61 .23	70.0 3.0	63.09 .25	14.1 0.8	58.92 .23	45.7 2.1	31.99 .41	20.9 3.0
28.6	18.83 .19	73.1 3.1	63.33 .22	13.3 0.7	59.14 .20	47.9 2.1	32.35 .31	24.1 3.3
July 8.6	19.00 .14	76.2 3.1	63.53 .18	12.7 0.5	59.32 .16	50.0 2.1	32.60 .19	27.5 3.2
18.5	19.11 +.09	79.4 +3.1	63.70 +.14	12.3 +0.3	59.47 +.12	52.1 +2.0	32.74 +.07	31.1 +3.6
28.5	19.18 +.04	82.4 3.0	63.81 .09	12.1 +0.2	59.57 .08	54.0 1.8	32.75 −.05	34.6 3.5
Aug. 7.5	19.19 −.02	85.4 2.9	63.89 +.05	12.0 0.0	59.63 +.03	55.8 1.7	32.64 .17	38.2 3.5
17.4	19.15 .07	88.2 2.6	63.91 .00	12.1 −0.2	59.64 −.01	57.3 1.5	32.42 .26	41.6 3.3
27.4	19.06 .11	90.7 2.3	63.89 −.04	12.3 0.3	59.61 .05	58.7 1.2	32.08 .30	44.8 3.1
Sept. 6.4	18.92 −.16	92.9 +2.0	63.82 −.08	12.7 −0.4	59.53 −.09	59.7 +1.0	31.64 −.48	47.8 +2.8
16.4	18.74 .19	94.7 1.7	63.72 .12	13.1 0.5	59.43 .12	60.6 0.7	31.11 .57	50.4 2.4
26.3	18.54 .22	96.2 1.3	63.59 .14	13.6 0.5	59.30 .14	61.2 0.5	30.50 .84	52.6 2.0
Oct. 6.3	18.31 .24	97.2 0.8	63.44 .15	14.1 0.5	59.15 .16	61.5 +0.2	29.83 .67	54.4 1.6
16.3	18.06 .24	97.8 +0.4	63.28 .16	14.6 0.5	58.99 .16	61.6 −0.1	29.12 .72	55.7 1.1
26.2	17.82 −.24	98.0 −0.1	63.12 −.16	15.1 −0.5	58.82 −.16	61.4 −0.3	28.38 −.74	56.5 +0.5
Nov. 5.2	17.58 .23	97.6 0.6	62.96 .14	15.5 0.4	58.66 .15	60.9 0.6	27.64 .73	56.7 −0.1
15.2	17.35 .21	96.7 1.0	62.83 .12	15.9 0.3	58.52 .13	60.3 0.8	26.91 .71	56.4 0.6
25.2	17.16 .18	95.5 1.5	62.72 .10	16.2 0.3	58.40 .11	59.3 1.1	26.22 .86	55.5 1.2
Dec. 5.1	16.99 .15	93.8 1.9	62.64 .07	16.4 0.2	58.30 .08	58.1 1.3	25.58 .80	54.0 1.8
15.1	16.86 −.11	91.6 −2.3	62.59 −.02	16.6 −0.2	58.24 −.05	56.8 −1.4	25.02 −.52	51.9 −2.3
25.1	16.77 .07	89.2 2.6	62.59 +.01	16.8 −0.1	58.21 −.01	55.2 1.6	24.55 .42	49.4 2.7
35.1	16.72 −.02	86.4 −2.9	62.62 +.05	16.9 0.0	58.21 +.02	53.6 −1.7	24.19 −.30	46.5 −3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 20 ^m 37	[°] +44 ['] 52	^h 20 ^m 46	[°] - 9 ['] 23	^h 20 ^m 52	[°] +80 ['] 8	^h 20 ^m 53	[°] +40 ['] 44
Jan. 0.1	38.63 -.08	77.1 -2.7	41.00 .00	51.7 -0.6	28.10 -.82	28.8 -2.6	2.13 -.08	40.1 -2.5
10.1	38.57 -.03	74.3 9.9	41.02 +.04	52.2 0.5	27.38 .81	25.9 3.0	2.07 -.04	37.5 2.7
20.0	38.57 +.02	71.3 3.0	41.08 .07	52.7 0.4	26.89 .38	22.8 3.2	2.05 +.01	34.7 2.8
30.0	38.61 .07	68.2 3.0	41.16 .10	53.1 0.3	26.62 -.14	19.4 3.4	2.09 .05	31.8 2.9
Feb. 9.0	38.70 .12	65.2 2.9	41.28 .13	53.3 -0.2	26.60 +.10	16.0 3.4	2.16 .10	29.0 2.7
19.0	38.85 +.17	62.4 -2.8	41.43 +.16	51.5 0.0	26.82 +.34	12.7 -3.2	2.29 +.15	26.3 -2.5
29.9	39.04 .21	59.9 2.3	41.61 .19	53.4 +0.2	27.23 .56	9.6 3.0	2.45 .19	23.9 2.2
Mar. 10.9	39.28 .26	57.8 1.9	41.81 .22	53.1 0.4	27.95 .77	6.8 2.6	2.67 .23	21.9 1.8
20.9	39.55 .29	56.2 1.4	42.04 .24	52.6 0.6	28.42 .94	4.4 2.1	2.92 .27	20.3 1.3
30.8	39.86 .32	55.1 0.8	42.29 .26	51.9 0.8	29.24 1.08	2.6 1.6	3.20 .30	19.2 0.8
Apr. 9.8	40.20 +.35	54.6 -0.2	42.57 +.28	51.0 +1.0	30.97 +1.18	1.3 -1.0	3.51 +.32	18.7 -0.2
19.8	40.56 .38	54.7 +0.4	42.86 .30	49.9 1.2	32.19 1.23	0.6 -0.4	3.85 .34	18.7 +0.3
29.8	40.93 .37	55.4 1.0	43.16 .31	48.7 1.3	33.44 1.25	0.5 +0.3	4.20 .35	19.3 0.9
May 9.7	41.30 .37	56.6 1.5	43.47 .31	47.3 1.4	34.68 1.22	1.1 0.9	4.55 .35	20.5 1.4
19.7	41.66 .35	58.4 2.0	43.79 .31	45.8 1.5	35.97 1.15	2.3 1.5	4.90 .35	22.1 1.9
29.7	42.01 +.33	60.6 +2.4	44.09 +.30	44.3 +1.5	36.98 +1.05	4.0 +2.0	5.24 +.33	24.2 +2.3
June 8.6	42.33 .30	63.1 2.7	44.39 .28	42.9 1.5	37.97 .91	6.2 2.4	5.56 .30	26.7 2.6
18.6	42.61 .26	66.0 3.0	44.66 .26	41.4 1.4	38.80 .75	8.8 2.8	5.85 .27	29.4 2.9
28.6	42.85 .22	69.1 2.2	44.91 .23	40.1 1.3	39.47 .57	11.8 3.1	6.11 .23	32.4 3.1
July 8.6	43.04 .17	72.3 3.3	45.12 .20	38.9 1.1	39.94 .37	15.1 3.3	6.32 .18	35.5 3.2
18.5	43.19 +.11	75.6 +3.3	45.30 +.15	37.9 +0.9	40.21 +.17	18.5 +3.5	6.48 +.13	38.7 +3.2
28.5	43.27 +.06	78.9 3.2	45.43 .11	37.0 0.8	40.28 -.04	22.0 3.6	6.58 .08	41.9 3.1
Aug. 7.5	43.30 .00	82.0 3.1	45.52 .07	36.3 0.7	40.13 .25	25.6 3.5	6.64 +.03	45.0 3.0
17.5	43.27 -.06	85.1 2.9	45.56 +.02	35.9 0.4	39.79 .45	29.1 3.5	6.64 -.03	48.0 2.8
27.4	43.19 .11	87.9 2.6	45.56 -.02	35.6 +0.2	39.24 .64	32.5 3.3	6.59 .08	50.7 2.6
Sept. 6.4	43.05 -.16	90.3 +2.3	45.52 -.06	35.4 0.0	38.50 -.22	35.7 +3.1	6.48 -.12	53.2 +2.3
16.4	42.88 .20	92.5 2.0	45.44 .09	35.5 -0.1	37.61 .97	32.6 2.8	6.34 .16	55.3 2.0
26.3	42.66 .23	94.3 1.6	45.33 .12	35.7 0.2	36.56 1.11	41.2 2.4	6.16 .19	57.1 1.6
Oct. 6.3	42.42 .25	95.7 1.1	45.20 .14	35.9 0.3	35.39 1.22	43.4 2.0	5.96 .22	58.5 1.2
16.3	42.16 .26	96.6 0.7	45.05 .15	36.3 0.4	34.12 1.30	45.2 1.5	5.73 .23	59.5 0.8
26.3	41.89 -.27	97.0 +0.2	44.90 -.15	36.7 -0.5	32.79 -1.25	46.4 +1.0	5.49 -.24	60.0 +0.3
Nov. 5.2	41.63 .26	96.9 -0.3	44.75 .14	37.2 0.6	31.41 1.37	47.1 +0.4	5.25 .23	60.1 -0.2
15.2	41.37 .24	96.4 0.8	44.62 .12	37.8 0.6	30.04 1.36	47.2 -0.2	5.02 .22	59.7 0.7
25.2	41.14 .22	95.3 1.3	44.50 .10	38.4 0.6	28.70 1.30	46.8 0.7	4.81 .20	58.7 1.1
Dec. 5.2	40.93 .19	93.7 1.8	44.41 .08	38.9 0.6	27.43 1.21	45.7 1.3	4.62 .17	57.4 1.6
15.1	40.76 -.15	91.7 -2.2	44.35 -.05	39.5 -0.6	26.27 -1.09	44.1 -1.9	4.46 -.14	55.6 -2.0
25.1	40.64 .11	89.4 2.5	44.32 -.01	40.1 0.6	25.25 .93	42.0 2.3	4.34 .10	53.4 2.3
35.1	40.55 -.08	86.7 -2.8	44.33 +.02	40.6 -0.6	24.41 -.74	39.4 -2.7	4.25 -.08	50.9 -2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61 ¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 21	^m 1	^h 21	^m 8	^h 21	^m 15	^h 21	^m 16
		+38° 12'		+29° 46'		+62° 6'		+19° 19'
Jan. 0.1	55.82 ^s -07	33.2 ^s -2.3	13.18 ^s -06	33.7 ^s -2.2	54.62 ^s -26	76.7 ^s -2.5	57.92 ^s -05	61.1 ^s -1.8
10.1	55.76 -03	30.8 2.5	13.13 -03	31.5 2.3	54.40 .19	74.0 2.9	57.88 -02	59.3 1.9
20.0	55.76 +01	28.2 2.6	13.12 +01	29.1 2.4	54.25 .11	71.0 3.1	57.88 +02	57.4 1.9
30.0	55.79 .06	25.5 2.7	13.15 .05	26.7 2.4	54.17 -03	67.7 3.3	57.92 .05	55.5 1.9
Feb. 9.0	55.87 .10	22.9 2.6	13.22 .09	24.3 2.3	54.18 +05	64.4 3.3	57.98 .08	53.6 1.8
19.0	55.99 +14	20.4 -2.4	13.33 +13	22.1 -2.1	54.27 +13	61.2 -3.1	58.09 +12	51.9 -1.6
28.9	56.16 .19	18.1 2.1	13.47 .16	20.1 1.8	54.44 .21	58.2 2.9	58.22 .15	50.4 1.3
Mar. 10.9	56.36 .23	16.3 1.7	13.66 .20	18.5 1.4	54.69 .29	55.4 2.5	58.39 .18	49.3 1.0
20.9	56.61 .26	14.8 1.2	13.87 .23	17.2 1.0	55.02 .35	53.1 2.1	58.59 .21	48.5 0.6
30.9	56.89 .29	13.8 0.7	14.12 .26	16.4 -0.5	55.40 .41	51.3 1.5	58.82 .24	48.1 -0.2
Apr. 9.8	57.20 +32	13.4 -0.2	14.40 +29	16.1 0.0	55.84 +46	50.1 -0.9	59.08 +27	48.1 +0.2
19.8	57.63 .34	13.5 +0.4	14.70 .31	16.3 +0.5	56.32 .49	49.4 -0.3	59.36 .29	48.5 0.7
29.8	57.88 .35	14.2 0.9	15.01 .32	17.0 1.0	56.82 .51	49.4 +0.3	59.66 .30	49.4 1.1
May 9.7	58.23 .36	15.4 1.4	15.34 .33	18.2 1.4	57.34 .51	50.0 0.9	59.97 .31	50.7 1.4
19.7	58.59 .35	17.1 1.9	15.66 .32	19.8 1.8	57.85 .50	51.2 1.5	60.28 .31	52.3 1.8
29.7	58.94 +34	19.2 +2.3	15.98 +31	21.8 +2.2	58.34 +48	52.9 +2.0	60.59 +30	54.2 +2.1
June 8.7	59.26 .32	21.7 2.6	16.29 .30	24.1 2.5	58.81 .44	55.2 2.4	60.89 .29	56.3 2.3
18.6	59.57 .28	24.5 2.9	16.57 .27	26.6 2.7	59.22 .39	57.8 2.8	61.17 .27	58.7 2.4
28.6	59.83 .24	27.5 3.1	16.83 .24	29.4 2.8	59.58 .33	60.8 3.1	61.43 .24	61.2 2.5
July 8.6	60.06 .20	30.6 3.2	17.04 .20	32.2 2.9	59.88 .26	64.1 3.4	61.65 .20	63.7 2.5
18.6	60.24 +15	33.8 +3.2	17.22 +15	35.1 +2.9	60.10 +18	67.6 +3.5	61.84 +16	66.2 +2.5
28.5	60.37 .10	37.0 3.2	17.35 .11	37.9 2.8	60.24 .10	71.2 3.6	61.98 .19	68.6 2.4
Aug. 7.5	60.45 +05	40.2 3.1	17.43 .06	40.7 2.7	60.31 +02	74.8 3.6	62.08 .08	70.9 2.2
17.5	60.47 .00	43.1 2.9	17.47 +01	43.2 2.5	60.23 -06	78.3 3.5	62.13 +03	73.0 2.0
27.4	60.44 -05	45.9 2.7	17.45 -04	45.6 2.3	60.19 .13	81.7 3.3	62.14 -01	75.0 1.8
Sept. 6.4	60.37 -09	48.5 +2.4	17.40 -06	47.7 +2.0	60.02 -31	84.9 +3.1	62.10 -05	76.6 +1.5
16.4	60.25 .13	50.7 2.0	17.30 .11	49.6 1.7	59.78 .27	87.8 2.8	62.03 .09	78.1 1.3
26.4	60.10 .17	52.6 1.7	17.17 .15	51.1 1.4	59.48 .33	90.4 2.4	61.93 .19	79.2 1.0
Oct. 6.3	59.92 .19	54.1 1.3	17.01 .17	52.3 1.0	59.13 .37	92.7 2.0	61.80 .14	80.1 0.7
16.3	59.72 .21	55.1 0.9	16.83 .18	53.1 0.6	58.74 .40	94.4 1.5	61.65 .15	80.6 0.4
26.3	59.51 -31	55.8 +0.4	16.64 -19	53.5 +0.2	58.32 -42	95.7 +1.0	61.49 -16	80.8 +0.1
Nov. 5.3	59.30 .21	56.0 0.0	16.45 .19	53.5 -0.1	57.89 .43	96.4 +0.5	61.32 .16	80.7 -0.3
15.2	59.09 .20	55.7 -0.5	16.27 .18	53.1 0.5	57.46 .43	96.6 -0.1	61.17 .15	80.3 0.6
25.2	58.90 .18	55.0 1.0	16.10 .16	52.4 0.9	57.03 .41	96.2 0.7	61.02 .14	79.6 0.9
Dec. 5.2	58.73 .16	53.8 1.4	15.95 .14	51.2 1.3	56.64 .38	95.2 1.2	60.90 .12	78.5 1.2
15.1	58.58 -13	52.2 -1.8	15.82 -11	49.7 -1.6	56.27 -34	93.7 -1.8	60.79 -08	77.2 -1.4
25.1	58.47 .09	50.2 2.1	15.73 .08	47.8 1.9	55.96 .29	91.7 2.3	60.71 .06	75.7 1.6
35.1	58.40 -05	48.0 -2.4	15.66 -04	45.7 -2.2	55.70 -22	89.2 -2.7	60.67 -03	74.0 -1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.			β Cephei.			ξ Aquarii.			ϵ Pegasi.		
	Right Ascension.	Declination South.		Right Ascension.	Declination North.		Right Ascension.	Declination South.		Right Ascension.	Declination North.	
	^h 21 ^m 25	— 6 3'		^h 21 ^m 27	+70° 4'		^h 21 ^m 31	— 8 20'		^h 21 ^m 38	+ 9 22'	
Jan. 0.1	44.02 —.03	25.0 —0.7		11.21 —.42	47.8 —2.4		51.72 —.03	58.4 —0.5		45.08 —.05	11.2 —1.3	
10.1	44.01 .00	25.7 0.6		10.83 .33	45.1 2.8		51.71 .00	58.9 0.5		45.04 —.02	9.9 1.3	
20.1	44.03 +.03	26.3 0.5		10.55 .23	42.2 3.1		51.72 +.03	59.3 0.4		45.04 +.01	8.5 1.4	
30.0	44.07 .06	26.7 0.4		10.38 —.19	39.0 3.3		51.76 .06	59.7 0.3		45.06 .04	7.2 1.3	
Feb. 9.0	44.15 .09	27.1 0.3		10.32 .00	35.6 3.3		51.83 .09	59.9 —0.1		45.11 .07	5.9 1.9	
19.0	44.25 +.12	27.3 —0.1		10.38 +.12	32.3 —3.9		51.93 +.12	60.0 0.0		45.20 +.10	4.8 —1.0	
28.9	44.39 .15	27.3 +.01		10.56 .23	29.2 3.0		52.06 .15	59.8 +0.2		45.31 .13	3.9 0.8	
Mar. 10.9	44.56 .18	27.1 0.3		10.84 .34	26.2 2.7		52.23 .18	59.5 0.4		45.46 .16	3.3 0.5	
20.9	44.75 .21	26.7 0.6		11.23 .44	23.7 2.3		52.42 .21	58.9 0.7		45.64 .19	2.9 —0.2	
30.9	44.98 .24	26.0 0.8		11.71 .52	21.6 1.8		52.64 .23	58.1 0.9		45.85 .22	2.0 +0.2	
Apr. 9.8	45.23 +.26	25.1 +1.0		12.27 +.59	20.1 —1.2		52.89 +.26	57.1 +1.1		46.09 +.25	3.3 +0.5	
19.8	45.50 .28	24.0 1.2		12.89 .64	19.2 —0.6		53.16 .28	55.9 1.3		46.35 .27	4.0 0.9	
29.8	45.79 .30	22.6 1.4		13.54 .08	18.8 0.0		53.45 .30	54.5 1.5		46.64 .29	5.0 1.2	
May 9.8	46.09 .31	21.1 1.6		14.22 .67	19.2 +0.6		53.75 .31	53.0 1.6		46.94 .30	6.3 1.5	
19.7	46.40 .31	19.5 1.7		14.80 .66	20.1 1.2		54.07 .31	51.3 1.7		47.24 .31	7.9 1.7	
29.7	46.72 +.31	17.8 +1.7		15.54 +.63	21.6 +1.6		54.38 +.31	49.7 +1.7		47.55 +.31	9.8 +1.9	
June 8.7	47.02 .30	16.1 1.7		16.14 .57	23.6 2.3		54.69 .30	48.0 1.7		47.86 .30	11.8 2.1	
18.6	47.31 .28	14.4 1.7		16.69 .50	26.1 2.7		54.99 .28	46.3 1.6		48.14 .28	13.0 2.1	
28.6	47.58 .23	12.8 1.6		17.16 .43	29.0 3.0		55.26 .26	44.6 1.5		48.41 .26	16.1 2.2	
July 8.0	47.82 .22	11.3 1.4		17.54 .34	32.2 3.3		55.51 .23	43.3 1.3		48.66 .22	18.2 2.1	
18.6	48.03 +.19	9.9 +1.3		17.84 +.24	35.6 +3.5		55.72 +.19	42.1 +1.2		48.86 +.19	20.4 +2.0	
28.5	48.19 .15	8.8 1.1		18.02 .13	39.2 3.6		55.90 .15	41.0 1.0		49.03 .15	22.3 1.9	
Aug. 7.5	48.32 .10	7.8 0.9		18.10 +.03	42.9 3.7		56.03 .11	40.2 0.7		49.15 .10	24.2 1.8	
17.5	48.39 .08	7.1 0.6		18.07 —.03	46.5 3.6		56.11 .08	39.5 0.5		49.24 .06	25.9 1.6	
27.5	48.43 +.01	6.5 0.4		17.94 .18	50.1 3.5		56.15 +.02	39.1 0.3		49.27 +.02	27.3 1.3	
Sept. 6.4	48.42 —.03	6.2 +0.2		17.70 —.29	53.5 +3.3		56.15 —.29	38.9 +0.1		49.27 —.02	28.5 +1.1	
16.4	48.37 .06	6.0 +0.1		17.38 .37	56.6 3.0		56.11 .06	38.8 0.0		49.23 .06	29.5 0.9	
26.4	48.29 .09	6.0 —0.1		16.97 .45	59.5 2.7		56.03 .09	39.0 —0.2		49.15 .09	30.3 0.6	
Oct. 6.3	48.18 .12	6.2 0.2		16.48 .51	62.0 2.3		55.93 .11	39.2 0.3		49.05 .11	30.8 0.4	
16.3	48.06 .13	6.5 0.3		15.94 .56	64.0 1.8		55.81 .13	39.6 0.4		48.92 .13	31.1 +0.1	
26.3	47.92 —.14	6.9 —0.4		15.36 —.60	65.6 +1.3		55.67 —.14	40.1 —0.5		48.79 —.14	31.1 —0.1	
Nov. 5.3	47.78 .14	7.4 0.5		14.74 .62	66.7 0.8		55.53 .14	40.6 0.6		48.64 .14	30.9 0.3	
15.2	47.65 .13	8.0 0.6		14.12 .62	67.2 +0.2		55.40 .13	41.2 0.8		48.50 .13	30.5 0.5	
25.2	47.52 .11	8.6 0.6		13.50 .61	67.1 —0.4		55.27 .12	41.8 0.6		48.37 .12	29.9 0.7	
Dec. 5.2	47.42 .09	9.2 0.7		12.90 .58	66.4 1.0		55.17 .10	42.4 0.6		48.26 .11	29.0 0.9	
15.2	47.34 —.07	9.9 —0.7		12.35 —.53	65.1 —1.5		55.04 —.07	43.0 —0.6		48.16 —.09	28.0 —1.1	
25.1	47.28 .04	10.6 0.7		11.85 .46	63.3 2.1		55.02 .05	43.6 0.6		48.08 .06	26.9 1.2	
35.1	47.25 —.01	11.2 —0.6		11.42 —.38	61.0 —2.6		54.99 —.02	44.2 —0.5		48.03 —.04	25.6 —1.3	

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 21 ^m 40	+70° 47'	^h 21 ^m 47	−14° 3'	^h 21 ^m 51	+73° 10'	^h 22 ^m 0	−0° 51'
Jan. 0.1	15.58 −.45	86.3 −2.2	15.88 −.04	79.7 −0.3	26.42 −.56	64.0 −2.1	6.16 −.06	21.6 −0.9
10.1	15.17 .37	83.9 2.6	15.85 −.02	80.0 0.2	25.90 .46	61.7 2.5	6.11 −.03	22.4 0.8
20.1	14.83 .28	81.0 3.0	15.85 +.01	80.1 −0.1	25.49 .35	58.9 2.9	6.09 .00	23.2 0.8
30.0	14.62 .17	77.9 3.2	15.88 .04	80.1 +0.1	25.20 .23	55.9 3.2	6.10 +.02	24.0 0.7
Feb. 9.0	14.52 −.04	74.6 3.3	15.94 .07	79.9 0.3	25.03 −.09	52.6 3.3	6.14 .05	24.6 0.5
19.0	14.54 +.08	71.3 −3.3	16.03 +.10	79.6 +0.4	25.01 +.05	49.3 −3.3	6.21 +.08	25.0 −0.3
Mar. 1.0	14.68 .20	68.1 3.1	16.15 .14	79.1 0.6	25.12 .18	46.1 3.1	6.31 .11	25.2 −0.1
10.9	14.94 .32	65.1 2.8	16.30 .17	78.3 0.8	25.38 .32	43.1 2.9	6.44 .15	25.3 +0.1
20.9	15.31 .22	62.5 2.4	16.48 .20	77.4 1.0	25.76 .44	40.3 2.5	6.60 .18	25.1 0.4
30.9	15.78 .51	60.3 1.9	16.70 .23	76.3 1.2	26.25 .55	38.0 2.1	6.80 .21	24.6 0.6
Apr. 9.9	16.34 +.59	58.6 −1.4	16.94 +.26	75.0 +1.4	26.85 +.64	36.2 −1.5	7.02 +.24	23.8 +0.9
19.8	16.96 .64	57.5 0.8	17.21 .26	73.6 1.5	27.53 .71	34.9 1.0	7.27 .26	22.8 1.1
29.8	17.63 .68	57.1 −0.2	17.50 .30	72.0 1.6	28.27 .75	34.3 −0.4	7.55 .28	21.5 1.4
May 9.8	18.32 .70	57.2 +0.4	17.81 .31	70.4 1.7	29.04 .78	34.2 +0.3	7.84 .30	20.0 1.6
19.7	19.02 .69	57.9 1.0	18.12 .32	68.7 1.7	29.82 .77	34.8 0.9	8.15 .31	18.3 1.7
29.7	19.70 +.06	59.3 +1.6	18.45 +.32	67.0 +1.7	30.59 +.75	36.0 +1.4	8.46 +.31	16.5 +1.6
June 8.7	20.34 .61	61.2 2.1	18.77 .31	65.4 1.6	31.32 .70	37.7 1.9	8.77 .30	14.6 1.9
18.7	20.92 .55	63.5 2.6	19.08 .30	63.8 1.5	31.99 .63	39.9 2.4	9.07 .29	12.7 1.9
28.6	21.44 .47	66.3 2.9	19.37 .28	62.4 1.3	32.58 .54	42.6 2.8	9.36 .27	10.8 1.9
July 8.6	21.86 .38	69.4 3.2	19.63 .25	61.2 1.1	33.09 .45	45.6 3.2	9.61 .24	9.0 1.8
18.6	22.19 +.28	72.8 +3.5	19.86 +.21	60.2 +0.9	33.48 +.34	48.9 +3.4	9.84 +.21	7.3 +1.6
28.6	22.42 .17	76.4 3.6	20.06 .17	59.4 0.7	33.76 .29	52.4 3.6	10.03 .17	5.8 1.4
Aug. 7.5	22.54 +.06	80.0 3.7	20.21 .13	58.8 0.4	33.92 +.10	56.1 3.7	10.19 .13	4.4 1.2
17.5	22.55 −.05	83.7 3.6	20.31 .08	58.5 +0.2	33.96 −.02	59.8 3.7	10.29 .09	3.3 1.0
27.5	22.45 .15	87.3 3.5	20.37 +.04	58.4 0.0	33.87 .14	63.4 3.6	10.36 +.04	2.4 0.8
Sept. 6.4	22.25 −.25	90.8 +3.4	20.38 −.01	54.5 −0.2	33.67 −.26	67.0 +3.5	10.38 .00	1.7 +0.6
16.4	21.95 .35	94.1 3.1	20.36 .05	58.7 0.3	33.36 .37	70.4 3.3	10.36 −.04	1.2 0.4
26.4	21.55 .43	97.1 2.8	20.29 .08	59.1 0.5	32.94 .46	73.5 3.0	10.31 .07	0.9 +0.9
Oct. 6.4	21.08 .50	99.8 2.5	20.20 .10	59.7 0.6	32.43 .55	76.3 2.6	10.23 .09	0.8 0.0
16.3	20.55 .56	102.0 2.0	20.09 .12	60.3 0.6	31.84 .62	78.7 2.2	10.12 .11	0.9 −0.2
26.3	19.96 −.60	103.8 +1.5	19.96 −.13	60.9 −0.6	31.18 −.68	80.7 +1.7	10.00 −.19	1.2 −0.3
Nov. 5.3	19.34 .63	105.0 1.9	19.82 .14	61.6 0.6	30.43 .71	82.2 1.2	9.87 .13	1.6 0.4
15.3	18.70 .64	105.7 +0.4	19.68 .13	62.2 0.6	29.76 .73	83.1 +0.6	9.74 .13	2.1 0.5
25.2	18.06 .63	105.8 −0.2	19.56 .12	62.8 0.6	29.02 .73	83.4 0.0	9.62 .12	2.7 0.6
Dec. 5.2	17.44 .61	105.4 0.8	19.45 .10	63.3 0.5	28.29 .71	83.1 −0.6	9.50 .11	3.4 0.7
15.2	16.85 −.56	104.3 −1.4	19.35 −.06	63.8 −0.4	27.60 −.67	82.3 −1.2	9.41 −.09	4.2 −0.8
25.1	16.31 .50	102.7 1.9	19.28 .06	64.2 0.3	26.96 .60	80.8 1.7	9.33 .07	5.0 0.8
35.1	15.85 −.42	100.5 −2.4	19.24 −.03	64.5 −0.2	26.39 −.52	78.8 −2.3	9.27 −.04	5.8 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 22 ^m 1	[°] —47 ['] 29	^h 22 ^m 10	[°] — 8 ['] 19	^h 22 ^m 19	[°] + 0 ['] 48	^h 22 ^m 29	[°] — 0 ['] 40
Jan. 0.1	15.30 —.10	53.7 +1.3	59.87 —.06	60.3 —0.5	37.78 —.07	62.9 —0.9	40.48 —.08	71.0 —0.8
10.1	15.22 .06	52.3 1.5	59.82 .04	60.8 0.4	37.73 .05	62.0 0.8	40.42 .05	71.8 0.8
20.1	15.18 —.02	50.6 1.8	59.80 —.01	61.2 0.3	37.69 —.08	61.2 0.8	40.38 —.03	72.5 0.7
30.0	15.19 +.03	48.7 2.0	59.80 +.02	61.5 0.2	37.68 +.01	60.4 0.7	40.36 .00	73.2 0.6
Feb. 9.0	15.24 .07	46.6 2.2	59.83 .05	61.6 —0.1	37.70 .03	59.7 0.6	40.37 +.02	73.7 0.5
19.0	15.34 +.12	44.2 +2.4	59.89 +.08	61.6 +0.1	37.75 +.06	59.2 —0.4	40.41 +.05	74.2 —0.3
Mar. 1.0	15.48 .17	41.8 2.5	59.98 .11	61.4 0.3	37.83 .09	58.9 —0.2	40.48 .08	74.4 —0.1
10.9	15.67 .22	39.2 2.5	60.11 .14	61.0 0.5	37.94 .13	58.8 0.0	40.58 .12	74.4 +0.1
20.9	15.91 .28	36.7 2.5	60.26 .17	60.3 0.8	38.08 .16	59.0 +0.3	40.71 .15	74.1 0.4
30.9	16.18 .20	34.2 2.5	60.45 .20	59.4 1.0	38.26 .19	59.4 0.6	40.88 .18	73.6 0.6
Apr. 9.9	16.49 +.23	31.7 +2.4	60.67 +.22	58.3 +1.2	38.47 +.22	60.1 +0.9	41.08 +.22	72.8 +0.9
19.8	16.84 .27	29.4 2.2	60.92 .28	57.0 1.4	38.71 .25	61.1 1.1	41.32 .25	71.8 1.2
29.8	17.22 .40	27.3 2.0	61.19 .28	55.5 1.6	38.97 .28	62.3 1.4	41.58 .27	70.5 1.4
May 9.8	17.63 .42	25.4 1.8	61.49 .30	53.8 1.7	39.26 .30	63.8 1.6	41.86 .29	69.0 1.6
19.7	18.06 .43	23.7 1.5	61.80 .31	52.1 1.8	39.56 .31	65.5 1.8	42.16 .31	67.2 1.8
29.7	18.49 +.43	22.4 +1.2	62.11 +.32	50.2 +1.8	39.87 +.31	67.3 +1.9	42.47 +.31	65.4 +1.9
June 8.7	18.92 .42	21.4 0.8	62.43 .31	48.4 1.8	40.19 .31	69.3 2.0	42.79 .31	63.5 2.0
18.7	19.35 .41	20.8 0.4	62.74 .30	46.6 1.7	40.49 .30	71.3 2.0	43.10 .30	61.5 2.0
28.6	19.75 .38	20.6 +0.1	63.04 .28	44.9 1.6	40.79 .28	73.2 1.9	43.39 .28	59.5 1.9
July 8.6	20.11 .35	20.7 —0.3	63.31 .26	43.4 1.5	41.06 .26	75.1 1.9	43.67 .26	57.7 1.8
18.6	20.44 +.30	21.2 —0.7	63.55 +.22	42.0 +1.3	41.30 +.22	76.9 +1.7	43.92 +.22	55.9 +1.7
28.6	20.72 .25	22.1 1.1	63.75 .18	40.8 1.1	41.50 .19	78.6 1.6	44.13 .20	54.3 1.5
Aug. 7.5	20.93 .19	23.4 1.4	63.92 .14	39.8 0.8	41.67 .15	80.1 1.4	44.31 .16	52.9 1.3
17.5	21.09 .13	24.9 1.6	64.04 .10	39.1 0.6	41.80 .10	81.3 1.3	44.45 .11	51.7 1.1
27.5	21.19 +.08	26.6 1.8	64.12 .06	38.6 0.4	41.88 .08	82.4 0.9	44.54 .07	50.7 0.9
Sept. 6.4	21.22 .09	28.5 —1.2	64.16 +.02	38.3 +0.2	41.92 +.02	83.2 +0.7	44.59 +.02	49.9 +0.6
16.4	21.19 —.06	30.4 1.9	64.15 —.02	38.3 0.0	41.92 —.02	83.8 0.5	44.60 —.01	49.4 0.4
26.4	21.10 .11	32.4 1.9	64.11 .06	38.4 —0.2	41.88 .05	84.2 0.3	44.58 .04	49.1 +0.2
Oct. 6.4	20.97 .15	34.2 1.8	64.04 .09	38.7 0.3	41.82 .08	84.4 +0.1	44.52 .07	49.0 0.6
16.3	20.80 .19	35.9 1.6	63.94 .11	39.1 0.5	41.73 .10	84.4 —0.1	44.43 .09	49.1 —0.2
26.3	20.59 —.21	37.3 —1.3	63.83 —.12	39.6 —0.6	41.62 —.12	84.2 —0.3	44.33 —.11	49.3 —0.3
Nov. 5.3	20.38 .22	38.5 1.0	63.70 .13	40.2 0.6	41.49 .12	83.8 0.4	44.22 .12	49.7 0.4
15.3	20.16 .28	39.3 0.6	63.57 .13	40.8 0.6	41.37 .12	83.4 0.5	44.10 .12	50.2 0.5
25.3	19.94 .21	39.6 —0.2	63.45 .12	41.5 0.6	41.25 .12	82.8 0.6	43.98 .12	50.8 0.6
Dec. 5.2	19.74 .18	39.6 +0.2	63.34 .11	42.1 0.6	41.13 .11	82.1 0.7	43.86 .11	51.4 0.7
15.2	19.57 —.15	39.2 +0.6	63.24 —.09	42.7 —0.6	41.03 —.08	81.4 —0.6	43.76 —.10	52.2 —0.7
25.1	19.44 .19	38.4 1.0	63.16 .07	43.3 0.5	40.94 .08	80.6 0.8	43.67 .08	52.9 0.8
35.1	19.33 —.09	37.2 +1.3	63.10 —.05	43.8 —0.5	40.88 —.06	79.7 —0.9	43.60 —.06	53.7 —0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei(B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	^h 22 ^m 30	+75° 39'	^h 22 ^m 35	+10° 15'	^h 22 ^m 45	+65° 36'	^h 22 ^m 46	- 8° 9'
Jan. 0.2	17.47 -74	44.9 -1.5	56.88 -09	22.0 -1.1	43.65 -41	88.4 -1.4	50.88 -08	63.2 -0.5
10.1	16.76 .65	43.1 9.1	56.80 .06	20.8 1.9	43.26 .37	86.6 2.0	50.81 .06	63.7 0.4
20.1	16.16 .54	40.8 2.5	56.75 .04	19.6 1.2	42.92 .31	84.4 2.4	50.75 .04	64.0 0.3
30.1	15.67 .41	38.1 2.9	56.72 -02	18.4 1.2	42.65 .24	81.8 2.7	50.73 -02	64.3 -0.2
Feb. 9.1	15.33 .27	36.1 3.1	56.71 +01	17.3 1.1	42.45 .16	78.9 3.0	50.72 +01	64.4 0.0
19.0	15.14 -11	31.9 -3.9	56.74 +04	16.3 -1.0	42.33 -07	75.9 -3.1	50.75 +04	64.3 +0.2
Mar. 1.0	15.11 +06	28.6 3.9	56.80 .07	15.4 0.8	42.31 +03	72.8 3.1	50.80 .07	64.0 0.4
11.0	15.25 .22	25.5 3.1	56.89 .11	14.7 0.5	42.39 .19	69.8 2.9	50.89 .10	63.6 0.6
20.9	15.55 .38	22.5 2.8	57.02 .14	14.4 -0.2	42.56 .22	66.9 2.7	51.01 .14	62.8 0.8
30.9	16.00 .52	19.9 2.4	57.18 .18	14.3 +0.1	42.82 .31	64.4 2.3	51.16 .17	61.9 4.1
Apr. 9.9	16.59 +64	17.7 -2.0	57.38 +21	14.5 +0.4	43.17 +38	62.3 -1.9	51.35 +20	60.7 +1.3
19.9	17.29 .75	15.9 1.5	57.61 .24	15.1 0.8	43.60 .46	60.7 1.4	51.57 .24	59.3 1.5
29.8	18.09 .83	14.8 0.9	57.87 .27	16.1 1.1	44.09 .51	59.6 0.8	51.83 .27	57.7 1.7
May 9.8	18.94 .88	14.2 -0.3	58.15 .29	17.3 1.4	44.63 .55	59.1 -0.2	52.11 .29	56.0 1.8
19.8	19.84 .90	14.2 +0.3	58.45 .31	18.8 1.6	45.20 .58	59.2 +0.4	52.41 .31	54.1 1.9
29.8	20.74 +89	14.8 +0.9	58.76 +31	20.6 +1.9	45.78 +58	59.8 +0.9	52.72 +32	52.2 +1.9
June 8.7	21.63 .86	16.1 1.5	59.08 .31	22.5 2.0	46.37 .57	61.1 1.5	53.04 .32	50.3 1.9
18.7	22.47 .81	17.8 2.0	59.39 .30	24.6 2.1	46.93 .55	62.8 2.0	53.35 .31	48.4 1.9
28.7	23.24 .73	20.1 2.5	59.68 .29	26.8 2.2	47.46 .50	65.1 2.4	53.66 .30	46.6 1.8
July 8.6	23.92 .63	22.8 2.9	59.96 .26	29.0 2.2	47.94 .45	67.7 2.8	53.95 .28	44.9 1.8
18.6	24.49 +52	25.8 +3.2	60.21 +22	31.2 +2.1	48.36 +38	70.7 +3.1	54.21 +25	43.4 +1.4
28.6	24.95 .39	29.1 3.4	60.43 .20	33.3 2.0	48.71 .31	74.0 3.4	54.45 .21	42.0 1.2
Aug. 7.6	25.27 .26	32.7 3.6	60.61 .16	35.3 1.9	48.98 .23	77.5 3.6	54.64 .18	41.0 0.9
17.5	25.46 +12	36.4 3.7	60.74 .11	37.1 1.7	49.17 .15	81.1 3.8	54.80 .14	40.2 0.7
27.5	25.52 -01	40.1 3.7	60.84 .07	38.7 1.5	49.27 +06	84.8 3.7	54.91 .09	39.6 0.5
Sept. 6.5	25.43 -16	43.9 +3.7	60.89 +03	40.1 +1.3	49.29 -02	88.4 +3.6	54.98 +05	39.2 +0.2
16.5	25.22 .28	47.5 3.6	60.90 -01	41.3 1.0	49.23 .10	92.0 3.4	55.01 +01	39.1 0.0
26.4	24.87 .40	51.0 3.4	60.88 .04	42.2 0.8	49.08 .18	95.3 3.2	55.00 -03	39.2 -0.2
Oct. 6.4	24.41 .51	54.2 3.1	60.82 .07	42.9 0.6	48.87 .25	98.5 3.0	54.96 .06	39.5 0.4
16.4	23.84 .61	57.1 2.7	60.74 .09	43.3 0.3	48.59 .31	101.3 2.6	54.89 .08	40.0 0.5
26.3	23.18 -70	59.6 +2.3	60.64 -11	43.6 +0.1	48.25 -36	103.7 +2.2	54.80 -10	40.5 -0.6
Nov. 5.3	22.44 .77	61.6 1.8	60.52 .12	43.6 -0.1	47.87 .40	105.7 1.7	54.69 .11	41.1 0.6
15.3	21.64 .81	63.2 1.9	60.40 .12	43.3 0.3	47.45 .43	107.1 1.2	54.58 .12	41.8 0.7
25.3	20.81 .84	64.1 0.7	60.27 .19	42.9 0.5	47.00 .45	108.1 0.6	54.46 .12	42.5 0.7
Dec. 5.2	19.96 .85	64.5 +0.1	60.15 .12	42.3 0.7	46.55 .46	108.5 +0.1	54.34 -11	43.2 0.7
15.2	19.11 -83	64.3 -0.5	60.04 -11	41.5 -0.9	46.09 -45	108.2 -0.5	54.24 -10	43.8 -0.6
25.2	18.30 .78	63.4 1.1	59.94 .10	40.6 1.0	45.65 .43	107.4 1.1	54.14 .09	44.4 0.6
35.2	17.56 -71	62.0 -1.7	59.86 -09	39.5 -1.1	45.23 -39	106.3 -1.6	54.06 -07	44.9 -0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (Fomalhaut.)		α Pegasi. (Markab.)		α Cephei.		θ Piscium.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 22 ^m 51	[°] 30 ['] 12	^h 22 ^m 59	[°] 14 ['] 36	^h 23 ^m 14	[°] 67 ['] 30	^h 23 ^m 22	[°] 5 ['] 46
Jan. 0.2	32.44 -10	34.9 +0.2	15.33 -10	45.5 -1.1	4.71 -47	45.9 -1.0	21.83 -10	22.9 -0.9
10.1	32.35 .08	34.5 0.5	15.23 .08	44.3 1.2	4.25 .44	44.5 1.6	21.73 .09	22.0 0.9
20.1	32.29 .05	33.9 0.8	15.16 .06	43.1 1.3	3.84 .38	42.7 2.1	21.65 .07	21.1 0.9
30.1	32.25 -.02	32.9 1.0	15.11 .04	41.8 1.3	3.49 .31	40.4 2.5	21.59 .05	20.3 0.8
Feb. 9.1	32.24 +0.1	31.8 1.3	15.08 -.01	40.5 1.3	3.21 .23	37.7 2.8	21.55 -.03	19.5 0.7
19.0	32.26 +0.4	30.4 +1.5	15.08 +0.08	39.2 -1.2	3.02 -1.4	34.8 -3.0	21.53 .00	18.8 -0.6
Mar. 1.0	32.22 .07	28.8 1.7	15.11 .05	38.2 1.0	2.92 -.04	31.7 3.0	21.54 +0.3	18.3 0.4
11.0	32.41 .11	26.9 1.9	15.18 .08	37.3 0.8	2.93 +0.6	28.7 3.0	21.50 .06	18.0 -0.2
21.0	32.55 .15	25.0 2.0	15.28 .12	36.7 0.5	3.04 .17	25.8 2.8	21.67 .10	17.9 +0.1
30.9	32.72 .19	22.9 2.1	15.42 .16	36.3 -0.2	3.26 .27	23.1 2.5	21.79 .14	18.0 0.3
Apr. 9.9	32.92 +.22	20.7 +2.2	15.60 +.20	36.3 +0.2	3.58 +.36	20.8 -2.1	21.94 +.18	18.5 +0.6
19.9	33.17 .26	18.4 2.3	15.81 .23	36.7 0.5	3.98 .44	18.9 1.7	22.14 .21	19.2 0.9
29.8	33.44 .29	16.2 2.2	16.06 .26	37.4 0.9	4.47 .52	17.4 1.1	22.36 .24	20.3 1.2
May 9.8	33.75 .32	14.0 2.2	16.34 .29	38.4 1.2	5.01 .57	16.6 -0.6	22.62 .27	21.6 1.4
19.8	34.08 .34	11.8 2.1	16.63 .31	39.8 1.5	5.61 .61	16.3 0.0	22.90 .29	23.2 1.7
29.8	34.43 +.35	9.8 +1.9	16.95 +.32	41.4 +1.8	6.23 +.63	16.6 +0.6	23.21 +.31	24.9 +1.9
June 6.7	34.78 .36	8.0 1.7	17.26 .32	43.3 2.0	6.86 .63	17.5 1.1	23.52 .31	26.9 2.0
16.7	35.14 .36	6.5 1.4	17.58 .31	45.4 2.1	7.48 .61	18.8 1.7	23.83 .31	28.9 2.1
26.7	35.49 .34	5.2 1.1	17.89 .30	47.6 2.2	8.08 .57	20.8 2.1	24.15 .30	31.0 2.1
July 6.6	35.82 .32	4.3 0.8	18.18 .28	49.9 2.3	8.63 .53	23.1 2.6	24.44 .29	33.1 2.1
16.6	36.12 +.29	3.6 +0.4	18.45 +.25	52.2 +2.3	9.13 +.48	25.9 +2.9	24.72 +.26	35.1 +2.0
26.6	36.39 .25	3.4 +0.1	18.68 .22	54.4 2.2	9.56 .39	29.0 3.2	24.97 .23	37.1 1.9
Aug. 7.6	36.62 .21	3.5 -0.2	18.88 .18	56.6 2.1	9.91 .31	32.3 3.5	25.18 .20	38.9 1.7
17.5	36.80 .16	3.8 0.5	19.04 .14	58.7 2.0	10.18 .22	35.9 3.6	25.36 .16	40.5 1.5
27.5	36.93 .11	4.5 0.8	19.15 .10	60.5 1.8	10.37 .14	39.5 3.7	25.51 .12	41.9 1.3
Sept. 6.5	37.02 +0.6	5.5 -1.1	19.23 +0.5	62.2 +1.6	10.46 +.05	43.2 +2.7	25.61 +0.08	43.1 +1.1
16.5	37.06 +0.1	6.7 1.2	19.26 +0.1	63.7 1.3	10.47 -.04	46.9 3.5	25.67 .04	44.1 0.9
26.4	37.05 -.03	8.0 1.4	19.26 -.02	64.9 1.1	10.39 .12	50.4 3.4	25.69 +0.1	44.8 0.6
Oct. 6.4	37.00 .06	9.4 1.4	19.22 .05	65.9 0.9	10.23 .29	53.7 3.2	25.68 -.02	45.3 0.4
16.4	36.92 .10	10.8 1.4	19.16 .08	66.6 0.6	10.00 .27	56.8 2.9	25.64 .05	45.6 +0.2
26.3	36.81 -.19	12.2 -1.3	19.07 -.10	67.1 +0.4	9.70 -.33	59.6 +2.5	25.58 -.07	45.7 0.0
Nov. 5.3	36.68 .13	13.4 1.2	18.96 .11	67.3 +0.1	9.33 .29	61.9 2.1	25.49 .09	45.6 -0.2
15.3	36.54 .14	14.5 1.0	18.85 .12	67.3 -0.1	8.92 .43	63.8 1.8	25.39 .10	45.3 0.3
25.3	36.40 .14	15.4 0.8	18.73 .12	67.0 0.4	8.47 .46	65.2 1.1	25.29 .11	44.9 0.5
Dec. 5.2	36.25 .14	16.1 0.5	18.60 .12	66.5 0.6	7.99 .48	66.0 +0.5	25.18 .11	44.4 0.6
15.2	36.12 -.13	16.4 -0.2	18.48 -.11	65.8 -0.8	7.50 -.49	68.2 -0.1	25.06 -.11	43.7 -0.7
25.2	36.00 .11	16.5 0.0	18.37 .10	64.9 1.0	7.01 .48	65.8 0.7	24.96 .10	43.0 0.6
35.2	35.90 -.09	16.4 +0.3	18.28 -.09	63.9 -1.1	6.54 -.46	64.8 -1.3	24.86 -.09	42.1 -0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	^h 23 ^m 34	+ 5° 1'	^h 23 ^m 34	+ 77° 0'	^h 23 ^m 49	+ 73° 47'	^h 23 ^m 53	+ 6° 15'
Jan. 0.2	16.16 ^s -10	42.1 -0.8	47.73 ^s -89	78.2 -0.6	27.41 ^s -72	65.5 -0.4	38.49 ^s -11	9.5 -0.7
10.2	16.07 .09	41.3 0.8	46.85 .85	77.3 1.2	26.72 .66	64.7 1.1	38.38 .10	8.7 0.8
20.2	15.98 .08	40.4 0.8	46.03 .77	75.8 1.7	26.06 .62	63.4 1.6	38.29 .09	7.9 0.8
30.1	15.91 .06	39.6 0.8	45.31 .67	73.8 2.2	25.47 .55	61.5 2.1	38.20 .07	7.1 0.8
Feb. 9.1	15.86 .04	38.9 0.7	44.70 .53	71.3 2.6	24.97 .45	59.2 2.5	38.14 .05	6.4 0.7
19.1	15.83 -0.1	38.3 -0.6	44.24 -38	68.5 -2.9	24.57 -33	56.5 -2.8	38.09 -0.3	5.7 -0.6
Mar. 1.1	15.84 +0.2	37.8 0.4	43.94 .21	65.5 3.1	24.30 .20	53.5 3.0	38.08 .00	5.2 0.4
11.0	15.87 .05	37.5 -0.2	43.82 -0.3	62.4 3.1	24.17 -0.7	50.5 3.1	38.09 +0.3	4.9 -0.2
21.0	15.94 .09	37.5 +0.1	43.88 +1.5	59.3 3.0	24.18 +0.8	47.4 3.0	38.14 .07	4.8 0.0
30.9	16.05 .13	37.7 0.3	44.13 .33	56.4 2.8	24.35 .23	44.5 2.8	38.22 .11	4.9 +0.3
Apr. 9.9	16.19 +1.6	38.2 +0.6	44.55 +5.0	53.7 -2.5	24.65 +3.7	41.9 -2.5	38.35 +1.5	5.3 +0.6
19.9	16.38 .20	38.9 0.9	45.13 .65	51.4 2.1	25.09 .50	39.5 2.1	38.52 .19	6.1 0.8
29.9	16.59 .33	40.0 1.2	45.84 .77	49.5 1.6	25.65 .61	37.6 1.7	38.72 .22	7.0 1.1
May 9.9	16.85 .26	41.3 1.4	46.67 .87	48.2 1.1	26.31 .70	36.2 1.2	38.96 .25	8.3 1.4
19.8	17.12 .29	42.9 1.7	47.59 .95	47.4 -0.5	27.05 .77	35.3 -0.6	39.23 .28	9.8 1.6
29.8	17.42 +3.1	44.6 +1.8	48.57 +9.9	47.2 +0.1	27.85 +2.2	35.0 0.0	39.52 +3.0	11.5 +1.8
June 8.8	17.74 .31	46.5 2.0	49.57 1.00	47.6 0.7	28.67 .83	35.3 +0.5	39.83 .31	13.4 1.9
18.7	18.05 .31	48.5 2.1	50.57 .98	48.5 1.2	29.51 .83	36.1 1.1	40.15 .22	15.4 2.0
28.7	18.37 .31	50.6 2.1	51.54 .94	50.0 1.7	30.33 .80	37.5 1.6	40.46 .31	17.4 2.1
July 8.7	18.67 .29	52.7 2.0	52.45 .87	52.0 2.2	31.11 .75	39.4 2.1	40.77 .30	19.5 2.1
18.7	18.95 +3.7	54.7 +2.0	53.28 +7.8	54.5 +2.7	31.83 +6.9	41.7 +2.5	41.06 +2.8	21.6 +2.0
28.6	19.21 .24	56.6 1.9	54.01 .68	57.4 3.0	32.48 .60	44.5 2.9	41.33 .25	23.5 1.9
Aug. 7.6	19.44 .21	58.4 1.7	54.63 .55	60.5 3.3	33.04 .51	47.6 3.2	41.57 .22	25.4 1.7
17.6	19.63 .17	60.0 1.5	55.12 .42	64.0 3.5	33.50 .41	50.9 3.5	41.78 .19	27.0 1.5
27.6	19.78 .13	61.4 1.3	55.47 .28	67.6 3.7	33.85 .30	54.5 3.6	41.95 .15	28.5 1.3
Sept. 6.5	19.90 +0.9	62.5 +1.0	55.68 +1.4	71.4 +3.8	34.09 +1.8	58.2 +3.7	42.08 +1.1	29.8 +1.1
16.5	19.97 .05	63.4 0.9	55.75 .00	75.2 3.8	34.22 +0.7	61.9 3.8	42.17 .07	30.7 0.9
26.5	20.01 +0.2	64.1 0.6	55.67 -1.5	79.0 3.7	34.23 -0.5	65.7 3.7	42.23 .04	31.5 0.7
Oct. 6.4	20.01 -0.1	64.6 0.3	55.46 .29	82.6 3.5	34.12 .16	69.3 3.5	42.25 +0.1	32.1 0.5
16.4	19.98 .04	64.8 +0.1	55.10 .42	86.0 3.3	33.91 .27	72.8 3.3	42.24 -0.2	32.4 +0.2
26.4	19.93 -0.6	64.9 -0.1	54.62 -5.4	89.2 +3.0	33.59 -3.7	76.0 +3.0	42.20 -0.5	32.6 0.0
Nov. 5.4	19.85 .08	64.7 0.2	54.02 .65	92.0 2.6	33.17 .46	78.8 2.6	42.14 .07	32.5 -0.1
15.3	19.76 .09	64.4 0.4	53.32 .74	94.4 2.1	32.67 .54	81.3 2.2	42.07 .06	32.3 0.3
25.3	19.66 .10	64.0 0.5	52.54 .82	96.3 1.6	32.09 .61	83.3 1.7	41.98 .09	31.9 0.4
Dec. 5.3	19.56 .11	63.5 0.6	51.68 .87	97.7 1.0	31.45 .66	84.7 1.2	41.88 .10	31.4 0.5
15.3	19.45 -1.1	62.8 -0.7	50.79 -2.0	98.4 +0.4	30.77 -6.9	85.6 +0.6	41.77 -1.1	30.8 -0.6
25.2	19.35 .10	62.1 0.8	49.88 .91	98.5 -0.2	30.07 .70	85.9 0.0	41.66 .11	30.1 0.7
35.2	19.25 -0.0	61.3 -0.8	48.98 -8.9	98.0 -0.8	29.36 -6.9	85.5 -0.6	41.56 -1.0	29.4 -0.8

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Mean Solar Date.	β Cassiop.	γ Androm.	σ Androm.	ι Ceti.	6 Urs. Min. S. P.	44 Piscium.	π Androm.	ϕ Cassiop.
	31° 28' h m 0 3	44° 33' h m 0 4	53° 50' h m 0 12	99° 26' h m 0 13	358° 19' h m 0 13	88° 41' h m 0 19	56° 54' h m 0 30	42° 19' h m 0 38
(Dec.30.3)	17.29 - .34	35.04 - .22	33.72 - .16	48.06 - .11	82.51 +7.71	44.69 - .12	59.29 - .18	34.73 - .25
Jan. 9.2	16.96 .32	34.83 .21	33.56 .16	47.96 .10	90.27 7.65	44.57 .11	59.11 .16	34.49 .24
19.2	16.65 .30	34.63 .20	33.40 .15	47.86 .09	97.81 7.39	44.48 .09	58.96 .15	34.25 .22
29.2	16.37 - .27	34.44 - .19	33.26 - .13	47.77 - .08	104.85 +6.84	44.39 - .08	58.81 - .14	34.04 - .19
Aug.26.6	21.60 + .21	38.77 + .18	37.22 + .17	51.38 + .14	48.20 -2.28	47.91 + .14	62.55 + .21	38.20 + .25
Sept. 5.5	21.79 .17	38.93 .13	37.38 .14	51.52 .13	45.67 1.99	48.05 .13	62.74 .16	38.43 .20
15.5	21.93 .11	39.04 .09	37.51 .10	51.65 .11	44.13 -1.01	48.18 .11	62.88 .12	38.59 .15
25.5	22.00 + .04	39.12 + .05	37.59 .08	51.73 .07	43.65 +0.06	48.26 .07	62.98 .08	38.72 .10
Oct. 5.5	22.01 - .02	39.15 .00	37.62 + .02	51.78 + .03	44.25 1.15	48.32 + .04	63.05 + .04	38.80 .05
15.4	21.97 - .07	39.12 - .04	37.63 - .01	51.79 - .01	45.95 +2.25	48.34 .00	63.07 .00	38.83 + .01
25.4	21.87 .13	39.07 .07	37.60 .04	51.77 .03	48.75 3.34	48.33 - .03	63.06 - .03	38.82 - .03
Nov. 4.4	21.71 .18	38.98 .11	37.54 .08	51.73 .05	52.63 4.39	48.29 .05	63.03 .05	38.77 .07
14.4	21.52 .22	38.84 .14	37.44 .11	51.67 .07	57.53 5.35	48.24 .07	62.96 .08	38.68 .11
24.3	21.27 .26	38.68 .17	37.32 .13	51.58 .09	63.33 6.19	48.16 .08	62.87 .10	38.55 .14
Dec. 4.3	21.00 - .20	38.51 - .18	37.19 - .14	51.49 - .10	69.91 +6.89	48.07 - .09	62.76 - .12	38.38 - .17
14.3	20.70 .31	38.32 .19	37.04 .16	51.39 .11	77.10 7.41	47.98 .10	62.63 .14	38.21 .19
24.2	20.38 .32	38.12 .20	36.87 .17	51.28 .11	84.72 7.70	47.88 .11	62.49 .15	38.01 .20
34.2	20.07 - .30	37.91 - .21	36.71 - .16	51.17 - .10	92.49 +7.72	47.77 - .11	62.33 - .16	37.80 - .21
Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	ζ Piscium.	κ Octantis, S. P.	ν Androm.
	83° 1' h m 0 42	29° 53' h m 0 50	52° 6' h m 0 50	4° 20' h m 0 53	159° 28' h m 1 12	86° 58' h m 1 12	184° 47' h m 1 23	49° 9' h m 1 30
(Dec.30.3)	57.50 - .11	3.34 - .34	37.89 - .17	47.99 -2.88	2.22 - .55	6.65 - .12	9.94 +2.80	19.81 - .15
Jan. 9.2	57.39 .12	3.00 .25	37.72 .18	45.13 2.85	1.68 .53	6.53 .12	12.76 2.81	19.64 .19
19.2	57.27 .11	2.65 .34	37.54 .18	42.28 2.83	1.15 .51	6.41 .12	15.57 2.75	19.44 .21
29.2	57.16 - .10	2.32 - .33	37.36 - .18	39.48 -2.80	0.65 - .49	6.29 - .12	18.26 +2.64	19.22 - .23
Sept. 5.6	60.71 + .14	7.48 + .26	41.30 + .19	63.09 +1.46	6.51 + .40	9.58 + .18	5.21 -1.65	22.92 + .26
15.5	60.84 .12	7.71 .20	41.47 .15	64.36 1.06	6.97 .32	9.76 .15	3.81 1.17	23.16 .21
25.5	60.95 .09	7.88 .13	41.60 .11	65.21 .85	7.15 .21	9.88 .12	2.87 .72	23.35 .16
Oct. 5.5	61.02 .06	7.98 .08	41.70 .07	65.66 + .24	7.29 + .10	9.99 .09	2.36 - .26	23.49 .12
15.5	61.07 + .03	8.04 + .03	41.74 + .03	65.68 - .20	7.35 .00	10.07 .06	2.36 + .25	23.60 .08
25.4	61.08 .00	8.03 - .04	41.76 .00	65.26 - .63	7.30 - .11	10.11 + .02	2.86 + .74	23.66 + .05
Nov. 4.4	61.06 - .03	7.96 .10	41.74 - .03	64.41 1.06	7.12 .22	10.12 - .01	3.84 1.23	23.70 + .02
14.4	61.04 .05	7.83 .16	41.69 .07	63.13 1.48	6.86 .30	10.10 .03	5.32 1.69	23.69 - .02
24.4	60.98 .07	7.63 .21	41.60 .10	61.45 1.86	6.52 .38	10.07 .05	7.21 2.08	23.65 .06
Dec. 4.3	60.90 .09	7.41 .25	41.49 .12	59.41 2.21	6.09 .45	10.01 .07	9.47 2.40	23.56 .10
14.3	60.81 - .10	7.14 - .29	41.36 - .14	57.04 -2.49	5.62 - .49	9.94 - .09	12.01 +2.63	23.46 - .13
24.3	60.70 .11	6.83 .32	41.20 .16	54.43 2.70	5.12 .51	9.84 .10	14.73 2.77	23.32 .16
34.2	60.50 - .11	6.51 - .34	41.04 - .17	51.65 -2.83	4.60 - .52	9.74 - .11	17.55 +2.82	23.14 - .19

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Mean Solar Date.	π Piscium.	ν Piscium.	ζ Ceti.	γ Androm.	β Trianguli.	4 Urs. Min., S. P.	γ Trianguli.	67 Ceti.
	78° 26' h m 1 31	85° 4' h m 1 35	100° 53' h m 1 46	48° 12' h m 1 57	55° 32' h m 2 2	348° 4' h m 2 9	56° 40' h m 2 10	96° 56' h m 2 11
(Dec.30.3)	15.28 - .12	41.73 - .11	1.27 - .12	8.31 - .15	59.40 - .13	14.26 +1.07	46.01 - .12	29.31 - .10
Jan. 9.2	15.16 - .12	41.62 - .12	1.15 - .12	8.15 - .17	59.26 - .16	15.33 - .11	45.88 - .15	29.21 - .11
19.2	15.04 - .12	41.50 - .13	1.03 - .13	7.96 - .19	59.08 - .17	16.47 1.15	45.71 - .18	29.09 - .13
29.2	14.91 - .12	41.37 - .12	0.89 - .14	7.76 - .21	58.91 - .18	17.63 1.14	45.53 - .18	28.96 - .14
Feb. 8.1	14.79 - .12	41.25 - .11	0.75 - .13	7.53 - .21	58.72 - .18	18.76 1.11	45.36 - .17	28.82 - .14
18.2	14.66 - .12	41.14 - .10	0.62 - .12	7.34 - .19	58.55 - .16	19.85 +1.07	45.18 - .16	28.68 - .13
Sept.25.6	18.42 + .14	44.83 + .13	4.20 + .16	11.69 + .21	62.59 + .20	12.24 - .54	49.13 + .21	32.07 + .16
Oct. 5.5	18.55 - .11	44.95 - .11	4.34 - .12	11.88 - .16	62.77 - .16	11.77 - .40	49.32 - .17	32.22 - .13
15.5	18.64 - .08	45.05 - .08	4.44 - .09	12.02 - .12	62.91 - .12	11.44 - .24	49.47 - .13	32.34 - .11
25.5	18.70 + .05	45.11 + .05	4.53 + .06	12.12 + .08	63.02 + .09	11.29 - .07	49.59 + .10	32.45 + .09
Nov. 4.5	18.73 + .02	45.16 + .03	4.57 + .02	12.19 - .05	63.10 - .06	11.30 + .11	49.67 - .07	32.52 - .05
14.5	18.74 - .01	45.17 - .00	4.58 - .01	12.22 + .01	63.14 + .02	11.51 - .31	49.73 - .04	32.55 + .02
24.4	18.72 - .03	45.15 - .03	4.57 - .03	12.22 - .03	63.14 - .01	11.92 - .49	49.74 + .01	32.57 - .00
Dec. 4.4	18.68 - .05	45.10 - .05	4.53 - .05	12.16 - .07	63.11 - .05	12.48 - .66	49.72 - .02	32.55 - .03
14.3	18.61 - .06	45.05 - .07	4.48 - .07	12.08 - .10	63.05 - .06	13.23 + .82	49.67 - .06	32.51 - .06
24.3	18.52 - .10	44.96 - .09	4.39 - .09	11.96 - .13	62.96 - .11	14.11 - .96	49.58 - .10	32.43 - .08
34.2	18.42 - .11	44.86 - .11	4.29 - .11	11.81 - .16	62.83 - .15	15.14 +1.10	49.46 - .13	32.35 - .10
Mean Solar Date.	δ Hydri.	δ Ceti.	μ Hydri.	θ Persei.	σ Arietis.	47 Cephei.	ϵ Arietis.	β Persei. (Algol.)
	159° 10' h m 2 19	90° 9' h m 2 33	169° 36' h m 2 33	41° 15' h m 2 36	75° 23' h m 2 45	11° 1' h m 2 51	69° 6' h m 2 52	49° 28' h m 3 0
(Dec.30.4)	48.82 - .52	50.32 - .10	64.47 -1.13	41.01 - .18	24.82 - .08	30.41 - .73	55.02 - .08	60.48 - .10
Jan. 9.3	48.29 - .54	50.22 - .11	63.32 -1.18	40.82 - .20	24.73 - .11	29.61 - .67	54.93 - .10	60.37 - .14
19.3	47.73 - .56	50.11 - .12	62.11 -1.21	40.61 - .22	24.60 - .13	28.68 - .98	54.81 - .13	60.19 - .18
29.3	47.16 - .56	49.97 - .14	60.88 -1.20	40.37 - .24	24.46 - .14	27.66 -1.04	54.66 - .15	60.00 - .20
Feb. 8.2	46.60 - .55	49.83 - .15	59.68 -1.19	40.12 - .25	24.32 - .14	26.61 -1.06	54.50 - .16	59.79 - .21
18.2	46.06 - .53	49.68 - .15	58.50 -1.17	39.87 - .25	24.17 - .15	25.54 -1.07	54.34 - .16	59.58 - .20
Sept.25.6	51.40 + .37	52.91 + .20	66.52 + .73	44.28 + .20	27.46 + .22	36.33 + .20	57.67 + .20	63.36 + .27
Oct. 5.6	51.72 - .27	53.09 - .16	67.15 - .59	44.55 - .25	27.66 - .18	37.17 - .78	57.87 - .19	63.62 - .24
15.5	51.94 - .17	53.23 - .13	67.57 - .31	44.78 - .20	27.82 - .15	37.86 - .64	58.06 - .17	63.65 - .21
25.5	52.06 + .07	53.36 + .11	67.77 + .09	44.95 + .15	27.96 + .12	38.44 + .48	58.22 + .14	64.05 + .17
Nov. 4.5	52.07 - .05	53.45 - .08	67.75 - .13	45.08 - .11	28.07 - .10	38.83 - .29	58.34 - .10	64.20 - .13
14.5	51.96 - .16	53.52 - .05	67.50 - .26	45.17 - .07	28.17 - .07	39.01 + .11	58.42 - .07	64.31 - .10
24.4	51.75 - .25	53.56 + .02	67.03 - .56	45.22 + .02	28.22 + .03	39.05 - .06	58.48 - .04	64.40 - .06
Dec. 4.4	51.46 - .34	53.56 - .01	66.38 - .74	45.21 - .03	28.23 - .00	38.89 - .26	58.51 + .01	64.43 + .01
14.4	51.08 - .41	53.53 - .04	65.54 - .91	45.15 - .06	28.22 - .03	38.52 - .45	58.50 - .02	64.42 - .03
24.4	50.64 - .47	53.49 - .06	64.56 -1.04	45.04 - .13	28.18 - .06	37.95 - .64	58.46 - .05	64.37 - .07
34.3	50.14 - .52	53.41 - .10	63.47 -1.16	44.89 - .19	28.10 - .09	37.25 - .78	58.39 - .08	64.25 - .11

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Octantis. S. P.	ϵ Hydri.	f Tauri.	γ Camelop.	γ Hydri.	ϵ Persei.	α^1 Tauri.	α Persei.
	185° 54' h m 3 17	167° 48' h m 3 18	77° 27' h m 3 24	19° 1' h m 3 38	164° 35' h m 3 48	50° 19' h m 3 50	68° 13' h m 3 58	42° 35' h m 4 0
(Dec. 30.4)	48.31 +2.14	47.22 - .83	47.80 - .06	46.10 - .28	60.90 - .59	28.30 - .06	11.50 - .03	40.71 - .08
Jan. 9.3	50.52 2.28	46.33 .94	47.73 .08	45.77 .38	60.26 .68	28.22 .10	11.45 .07	40.61 .19
19.3	52.88 2.40	45.34 1.03	47.63 .11	45.34 .47	59.53 .77	28.10 .15	11.36 .10	40.47 .17
29.3	55.32 2.46	44.28 1.06	47.49 .14	44.83 .54	58.71 .84	27.92 .18	11.24 .14	40.29 .21
Feb. 8.3	57.79 2.46	43.21 1.07	47.35 .16	44.27 .58	57.86 .87	27.73 .20	11.08 .16	40.06 .24
18.2	60.24 +2.41	42.13 -1.07	47.18 - .17	43.68 - .59	56.97 - .88	27.52 - .21	10.92 - .17	39.82 - .26
28.2	62.58 +2.30	41.08 -1.03	47.02 - .16	43.09 - .58	56.09 - .87	27.30 - .22	10.74 - .18	39.58 - .26
Oct. 5.6	55.28 -1.06	47.42 + .00	50.34 + .22	50.35 + .02	60.18 + .00	31.07 + .22	13.93 + .26	43.57 + .33
15.6	54.34 .77	47.97 .47	50.55 .19	50.93 .54	60.72 .48	31.36 .27	14.18 .23	43.89 .31
25.5	53.75 - .38	48.36 + .29	50.72 + .15	51.43 + .45	61.14 + .36	31.61 + .22	14.40 + .20	44.19 + .28
Nov. 4.5	53.59 + .07	48.54 + .09	50.86 .13	51.83 .36	61.43 .22	31.83 .20	14.59 .18	44.45 .24
14.5	53.89 .49	48.55 - .10	50.99 .11	52.15 .26	61.56 + .06	32.01 .17	14.76 .15	44.67 .20
24.5	54.57 .89	48.35 .28	51.09 .08	52.34 .14	61.55 - .08	32.16 .13	14.89 .11	44.84 .15
Dec. 4.4	55.67 1.30	47.99 .46	51.14 + .04	52.43 + .03	61.39 .23	32.26 .08	14.98 .07	44.96 .10
14.4	57.16 +1.65	47.43 - .63	51.16 .00	52.40 - .06	61.09 - .36	32.31 + .03	15.04 + .04	45.03 + .05
24.4	58.96 1.94	46.74 .77	51.15 - .03	52.26 .20	60.02 .22	32.31 - .02	15.06 .00	45.03 - .01
34.4	61.03 +2.19	45.89 - .87	51.10 - .07	52.00 - .31	60.06 - .61	32.27 - .07	15.04 - .04	44.99 - .06
Mean Solar Date.	α^1 Eridani.	η Urs. Min., S. P.	δ Mensæ.	m Persei.	τ Tauri.	ϵ Tauri.	ζ Aurigæ.	β Eridani.
	97° 8' h m 4 6	346° 1' h m 4 20	170° 28' h m 4 25	47° 10' h m 4 25	67° 15' h m 4 35	71° 21' h m 4 44	49° 5' h m 4 54	95° 14' h m 5 2
(Dec. 30.4)	20.86 - .03	39.31 + .48	34.17 - .85	40.72 - .03	38.64 .00	56.44 + .02	47.57 + .02	26.78 + .02
Jan. 9.4	20.81 .07	39.86 .63	33.20 1.07	40.67 .07	38.62 - .04	56.43 - .03	47.56 - .04	26.77 - .03
19.4	20.72 .10	40.56 .76	32.04 1.23	40.58 .12	38.56 .08	56.38 .07	47.50 .09	26.72 .07
29.3	20.61 .13	41.39 .86	30.75 1.34	40.42 .17	38.45 .19	56.29 .11	47.38 .15	26.63 .10
Feb. 8.3	20.46 .15	42.27 .92	29.36 1.42	40.23 .21	38.31 .15	56.16 .14	47.20 .19	26.51 .14
18.3	20.30 - .17	43.22 + .96	27.90 -1.46	40.01 - .23	38.15 - .17	56.01 - .17	47.00 - .21	26.35 - .17
28.2	20.12 .18	44.19 .95	26.43 1.45	39.78 .23	37.97 .18	55.83 .18	46.78 .22	26.18 .18
Mar. 10.2	20.95 - .17	45.12 + .91	24.99 -1.62	39.55 - .23	37.79 - .18	55.65 - .17	46.55 - .23	26.00 - .19
Oct. 15.6	32.07 + .21	38.94 - .74	30.23 + .89	43.62 + .31	41.10 + .27	58.77 + .25	50.23 + .33	28.62 + .23
25.6	32.27 + .19	38.27 - .60	31.02 + .89	43.92 + .29	41.36 + .26	59.02 + .24	50.55 + .31	28.85 + .22
Nov. 4.6	32.45 .16	37.75 .45	31.61 .48	44.20 .26	41.59 .23	59.27 .23	50.85 .29	29.08 .21
14.5	32.60 .13	37.37 .30	31.97 + .24	44.43 .22	41.80 .19	59.48 .19	51.12 .26	29.28 .19
24.5	32.72 .10	37.15 - .14	32.08 - .02	44.63 .18	41.96 .15	59.65 .15	51.26 .21	29.46 .16
Dec. 4.5	32.80 .06	37.10 + .03	31.93 .27	44.78 .13	42.10 .12	59.79 .12	51.53 .16	29.59 .12
14.4	32.85 + .03	37.22 + .21	31.53 - .51	44.87 + .07	42.20 + .08	59.91 + .09	51.67 + .11	29.70 + .08
24.4	32.86 - .01	37.53 .20	30.90 .75	44.92 + .02	42.25 + .03	59.97 + .05	51.75 + .06	29.76 + .04
34.4	32.83 - .04	38.00 + .25	30.03 - .90	44.91 - .05	42.26 - .01	59.90 .00	51.78 .00	29.78 .00

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58' h m 5 12	57° 54' h m 5 25	4° 52' h m 5 26	99° 43' h m 5 42	50° 53' h m 5 43	155° 47' h m 5 44	45° 4' h m 5 51	52° 48' h m 5 52
(Dec.30.4)	16.21 + .02	34.40 + .05	57.44 - .21	32.72 + .06	52.23 + .06	37.94 - .15	28.02 + .09	13.57 + .09
Jan. 9.4	16.21 - .02	34.43 + .01	56.98 .70	32.75 .00	52.28 + .02	37.75 .93	28.08 + .02	13.63 + .03
19.4	16.17 .06	34.41 - .04	56.03 1.15	32.72 - .05	52.27 - .04	37.48 .31	28.07 - .04	13.63 - .03
29.4	16.09 .10	34.34 .10	54.68 1.56	32.66 .09	52.20 .09	37.12 .30	28.00 .10	13.57 .08
Feb. 8.3	15.96 .14	34.22 .15	52.88 1.85	32.55 .19	52.09 .14	36.70 .46	27.88 .15	13.47 .13
18.3	15.81 - .16	34.05 - .18	50.73 - 2.25	32.42 - .15	51.92 - .18	36.19 - .59	27.69 - .30	13.31 - .18
28.3	15.64 .17	33.87 .19	48.41 2.27	32.25 .17	51.72 .21	35.66 .55	27.48 .93	13.12 .30
Mar. 10.3	15.46 .18	33.67 .30	45.99 2.44	32.07 .18	51.50 .22	35.09 .57	27.24 .94	12.91 .31
20.2	15.28 - .17	33.46 - .31	43.54 - 2.43	31.89 - .18	51.28 - .22	34.52 - .55	26.99 - .35	12.70 - .30
.
Oct. 25.6	18.21 + .34	37.02 + .30	67.19 + 2.56	34.49 + .36	54.86 + .35	36.78 + .47	30.73 + .38	16.12 + .33
Nov. 4.6	18.44 .22	37.31 .28	69.63 2.29	34.74 .24	55.20 .33	37.22 .41	31.10 .26	16.45 .32
14.6	18.65 .20	37.58 .26	71.76 1.25	34.96 .22	55.52 .30	37.59 .33	31.45 .33	16.77 .30
24.5	18.84 .17	37.83 .23	73.52 1.56	35.19 .18	55.80 .26	37.87 .24	31.77 .30	17.05 .27
Dec. 4.5	18.98 .13	38.04 .19	74.87 1.11	35.35 .15	56.06 .22	38.06 .14	32.04 .25	17.31 .23
14.5	19.09 + .09	38.20 + .14	75.74 + .02	35.50 + .12	56.24 + .17	38.15 + .04	32.26 + .19	17.51 + .18
24.5	19.16 .05	38.31 .09	76.11 + .12	35.59 .07	56.38 .19	38.14 - .07	32.42 .13	17.66 .19
34.4	19.19 + .01	38.36 + .04	75.99 - .37	35.64 + .02	56.47 + .07	38.01 - .18	32.52 + .06	17.76 + .06
.
Mean Solar Date.	η Geminor.	ψ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ϵ Geminor.	ϕ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28' h m 6 8	40° 39' h m 6 16	69° 43' h m 6 22	342° 41' h m 6 22	64° 46' h m 6 37	46° 19' h m 6 38	55° 54' h m 6 45	170° 42' h m 6 49
(Dec.30.5)	14.55 + .09	26.14 + .15	26.15 + .10	58.19 + .04	10.11 + .12	49.00 + .15	32.67 + .14	21.67 - .16
Jan. 9.5	14.62 + .05	26.24 + .06	26.23 + .05	58.29 .16	10.21 .07	49.12 .09	32.79 .10	21.38 .42
19.4	14.64 - .01	26.26 - .01	26.26 .00	58.52 .29	10.26 + .02	49.17 + .02	32.86 + .04	20.84 .66
29.4	14.60 .08	26.21 .08	26.24 - .04	58.88 .43	10.26 - .03	49.16 - .04	32.86 - .02	20.07 .88
Feb. 8.4	14.52 .10	26.10 .14	26.18 .08	59.36 .53	10.20 .07	49.09 .10	32.81 .07	19.09 1.08
18.3	14.41 - .14	25.93 - .19	26.07 - .12	59.93 + .02	10.10 - .11	48.95 - .15	32.72 - .13	17.91 - 1.25
28.3	14.25 .16	25.72 .24	25.93 .16	60.60 .70	9.98 .15	48.78 .19	32.56 .17	16.60 1.37
Mar. 10.3	14.08 .18	25.46 .27	25.75 .17	61.34 .74	9.80 .18	48.58 .22	32.38 .19	15.18 1.47
20.3	13.89 .19	25.19 .28	25.57 .18	62.08 .76	9.62 .19	48.35 .24	32.18 .20	13.67 1.53
30.2	13.71 .18	24.91 .27	25.39 .17	62.85 .77	9.43 .19	48.10 .25	31.98 .21	12.13 1.54
Apr. 9.2	13.54 - .17	24.65 - .26	25.22 - .16	63.61 + .76	9.25 - .18	47.86 - .23	31.76 - .22	10.59 - 1.52
.
Nov. 14.6	17.33 + .37	29.61 + .37	29.81 + .28	56.37 - .56	12.82 + .30	52.14 + .36	35.54 + .24	14.41 + .26
24.6	17.59 .24	29.97 .24	29.08 .26	57.86 .45	13.11 .28	52.49 .24	35.87 .21	15.27 .76
Dec. 4.6	17.82 .21	30.30 .20	29.33 .23	57.46 .35	13.38 .25	52.82 .20	36.17 .27	15.92 .53
14.5	18.02 + .17	30.56 + .26	29.53 + .18	57.17 - .22	13.61 + .21	53.09 + .25	36.42 + .22	16.33 + .28
24.5	18.16 .12	30.76 .19	29.70 .14	57.03 - .07	13.80 .16	53.31 .19	36.64 .19	16.48 .00
34.5	18.26 + .07	30.91 + .11	29.81 + .09	57.04 + .08	13.93 + .10	53.48 + .13	36.79 + .13	16.33 - .28

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ Volantis.	β Can. Min.	26 Lyncis.	Groombr. 1374.	ω ¹ Cancri.
	69° 16' h m 6 57	50° 30' h m 7 4	7° 23' h m 7 7	160° 19' h m 7 9	81° 29' h m 7 21	42° 9' h m 7 46	15° 47' h m 7 47	64° 18' h m 7 54
(Dec. 30.5)	35.37 + .15	5.72 + .16	60.67 + .70	44.79 + .06	11.41 + .14	42.53 + .25	3.23 + .54	16.75 + .18
Jan. 9.5	35.49 .10	5.86 .12	61.19 + .34	44.78 - .06	11.53 .10	42.75 .19	3.67 .34	16.92 .15
19.5	35.56 + .04	5.95 + .06	61.35 .00	44.63 .30	11.62 .06	42.90 .19	3.92 .17	17.06 .11
29.4	35.57 - .01	5.97 - .01	61.18 - .35	44.38 .31	11.65 + .01	42.99 + .05	4.01 + .01	17.13 + .05
Feb. 8.4	35.54 .06	5.93 .06	60.66 .68	44.01 .42	11.63 - .04	42.99 - .02	3.93 - .16	17.15 - .01
18.4	35.46 - .10	5.84 - .12	59.83 .96	43.53 - .52	11.57 - .08	42.94 - .08	3.68 - .31	17.11 - .05
29.4	35.33 .14	5.69 .17	58.74 1.30	42.98 .50	11.48 .11	42.81 .15	3.31 .44	17.03 .09
Mar. 10.4	35.18 .16	5.51 .30	57.44 1.37	42.35 .65	11.35 .14	42.63 .20	2.80 .55	16.91 .14
20.3	35.01 .17	5.30 .21	56.00 1.49	41.67 .69	11.19 .16	42.42 .23	2.21 .63	16.76 .16
30.3	34.83 .18	5.08 .22	54.47 1.54	40.98 .70	11.02 .17	42.16 .24	1.55 .67	16.59 .17
Apr. 9.2	34.65 - .18	4.86 - .21	52.92 - 1.52	40.30 - .68	10.85 - .16	41.93 - .25	0.86 - .69	16.42 - .17
19.2	34.48 - .17	4.66 - .20	51.42 - 1.44	39.63 - .65	10.70 - .14	41.68 - .24	0.17 - .68	16.25 - .16
Nov. 24.6	38.20 + .28	8.97 + .34	69.84 + 1.66	43.14 + .47	13.90 + .28	45.81 + .44	8.31 + .23	19.45 + .34
Dec. 4.6	38.47 .25	9.30 .31	71.41 1.47	43.56 .36	14.17 .25	46.23 .40	9.19 .83	19.78 .31
14.6	38.71 + .22	9.60 + .26	72.77 + 1.20	43.87 + .25	14.41 + .23	46.60 + .35	9.96 + .72	20.08 + .28
24.5	38.92 .18	9.85 .20	73.81 .89	44.06 + .13	14.63 .19	46.93 .30	10.63 .69	20.35 .23
34.5	39.06 + .13	10.03 + .14	74.54 + .56	44.13 .00	14.78 + .12	47.20 + .25	11.16 + .47	20.57 + .16
Mean Solar Date.	ζ ¹ Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydæ.	γ Cancri.	σ ² Cancri. (mean.)	θ Hydæ.
	72° 1' h m 8 5	60° 26' h m 8 10	93° 33' h m 8 20	167° 8' h m 8 23	86° 16' h m 8 33	68° 8' h m 8 36	59° 0' h m 8 47	87° 13' h m 9 8
(Dec. 30.6)	54.37 + .20	33.15 + .18	10.05 + .19	61.76 + .30	0.73 + .21	55.32 + .26	32.07 + .26	38.54 + .25
Jan. 9.6	54.55 .15	33.32 .15	10.22 .15	61.99 + .15	0.92 .17	55.54 .19	32.31 .20	38.77 .20
19.5	54.68 .11	33.46 .11	10.35 .11	62.05 - .02	1.07 .19	55.70 .14	32.51 .14	38.95 .15
29.5	54.77 .06	33.54 .06	10.43 .06	61.94 .21	1.17 .07	55.82 .09	32.64 .10	39.07 .10
Feb. 8.5	54.81 + .01	33.57 + .01	10.46 + .01	61.65 .38	1.22 + .02	55.88 + .04	32.72 + .05	39.16 .06
18.4	54.79 - .04	33.55 - .04	10.45 - .03	61.18 - .55	1.22 - .02	55.90 - .01	32.75 .00	39.20 + .01
28.4	54.72 .09	33.49 .06	10.39 .07	60.55 .70	1.17 .06	55.86 .06	32.72 - .05	39.18 - .03
Mar. 10.4	54.61 .12	33.40 .11	10.29 .11	59.78 .82	1.10 .09	55.78 .10	32.64 .10	39.14 .07
20.4	54.48 .14	33.27 .14	10.17 .14	58.92 .90	0.99 .12	55.66 .13	32.52 .14	39.05 .10
30.3	54.32 .16	33.12 .16	10.02 .16	57.98 .97	0.85 .14	55.53 .15	32.37 .16	38.94 .12
Apr. 9.3	54.16 - .17	32.96 - .17	9.85 - .16	56.98 - 1.02	0.70 - .15	55.38 - .17	32.21 - .17	38.81 - .13
19.3	53.99 .15	32.80 .16	9.70 .15	55.95 1.04	0.55 .15	55.20 .16	32.03 .17	38.67 .14
29.3	53.85 .14	32.65 .14	9.55 .14	54.91 1.03	0.40 .14	55.05 .15	31.87 .16	38.53 .14
May 9.6	53.71 - .14	32.52 - .11	9.41 - .13	53.89 - 1.00	0.26 - .13	54.90 - .14	31.72 - .15	38.39 - .13

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	β Argus.	α Lynceis.	10 Leonis Minoris.	σ Leonis.	ζ Chamæ- leontis.	19 Leonis Minoris.	π Leonis.	λ Ursæ Ma- joris.
	159° 16' h m 9 11	55° 8' h m 9 14	58° 7' h m 9 27	79° 36' h m 9 35	170° 27' h m 9 37	48° 25' h m 9 50	81° 25' h m 9 54	46° 32' h m 10 10
(Dec.30.6)	62.27 + .40	21.16 + .30	29.05 + .30	16.68 + .27	12.94 + .82	56.72 + .34	23.86 + .37	27.52 + .37
Jan. 9.6	62.61 .98	21.44 .25	29.34 .37	16.93 .23	13.65 .60	57.05 .31	24.12 .34	27.88 .34
19.6	62.83 .16	21.67 .30	29.60 .32	17.14 .18	14.14 .38	57.35 .26	24.35 .30	28.21 .29
29.5	62.93 + .04	21.85 .15	29.79 .16	17.30 .14	14.41 + .15	57.58 .90	24.52 .16	28.46 .32
Feb. 8.5	62.91 - .08	21.96 .09	29.92 .10	17.42 .10	14.43 - .10	57.74 .13	24.66 .11	28.65 .16
18.5	62.78 - .19	22.01 + .03	30.00 + .04	17.49 + .05	14.21 - .32	57.84 + .07	24.74 + .06	28.78 + .09
28.5	62.53 .30	22.02 - .03	30.01 - .02	17.51 .00	13.79 .53	57.89 + .01	24.78 + .02	28.86 + .03
Mar. 10.4	62.19 .33	21.96 .08	29.97 .07	17.48 - .05	13.16 .73	57.87 - .05	24.78 - .03	28.86 - .03
20.4	61.78 .45	21.86 .12	29.88 .11	17.41 .08	12.34 .89	57.80 .10	24.73 .06	28.81 .08
30.4	61.30 .51	21.73 .15	29.75 .15	17.32 .10	11.39 1.03	57.68 .14	24.65 .09	28.70 .12
Apr. 9.3	60.76 - .55	21.56 - .17	29.59 - .17	17.21 - .12	10.28 -1.15	57.53 - .17	24.55 - .11	28.56 - .15
19.3	60.20 .57	21.39 .18	29.42 .18	17.08 .14	9.09 1.23	57.35 .18	24.42 .12	28.39 .17
29.3	59.62 .58	21.21 .17	29.24 .17	16.94 .13	7.82 1.98	57.17 .19	24.30 .13	28.21 .19
May 9.3	59.03 .59	21.04 .16	29.07 .16	16.81 .13	6.52 1.31	56.98 .19	24.17 .13	28.01 .19
19.2	58.44 - .58	20.88 - .15	28.91 - .15	16.68 - .12	5.19 -1.34	56.80 - .18	24.04 - .12	27.83 - .17
Mean Solar Date.	μ Hydræ.	β Leonis Minoris.	α Antliæ.	β Octantis, S. P.	41 Leonis Minoris.	δ Chamæ- leontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 16' h m 10 20	52° 43' h m 10 21	120° 30' h m 10 22	188° 2' h m 10 34	66° 14' h m 10 37	169° 57' h m 10 44	55° 11' h m 10 47	11° 38' h m 10 51
Jan. 19.6	46.61 + .23	31.72 + .27	7.60 + .21	37.30 - .64	26.30 + .26	50.47 + .75	9.83 + .30	11.59 + .26
29.6	46.81 .17	31.97 .22	7.79 .17	36.78 .40	26.53 .21	51.12 .56	10.10 .24	12.47 .20
Feb. 8.6	46.95 .12	32.17 .16	7.94 .12	36.50 - .16	26.72 .17	51.56 .33	10.31 .19	13.19 .61
18.5	47.05 .07	32.29 .10	8.03 .07	36.47 + .09	26.86 .12	51.78 + .12	10.47 .14	13.68 .39
28.5	47.10 + .03	32.38 + .05	8.08 + .02	36.67 .32	26.95 .07	51.81 - .08	10.58 .06	13.97 + .12
Mar. 10.5	47.11 - .01	32.39 .00	8.07 - .02	37.11 + .55	26.98 + .02	51.62 - .28	10.63 + .02	14.05 - .03
20.4	47.08 .06	32.37 - .05	8.03 .06	37.77 .78	26.98 - .02	51.26 .46	10.63 - .02	13.91 .23
30.4	47.00 .08	32.29 .10	7.94 .10	38.66 .29	26.93 .06	50.70 .63	10.59 .06	13.59 .42
Apr. 9.4	46.91 .10	32.18 .13	7.83 .12	39.76 1.17	26.85 .09	50.00 .78	10.50 .09	13.08 .58
19.4	46.80 .12	32.04 .15	7.70 .14	41.00 1.32	26.76 .11	49.15 .20	10.40 .12	12.44 .70
29.3	46.68 - .13	31.88 - .16	7.55 - .16	42.42 +1.48	26.64 - .13	48.20 -1.01	10.26 - .14	11.62 - .20
May 9.3	46.55 .13	31.71 .17	7.39 .16	43.96 1.52	26.50 .13	47.14 1.09	10.12 .15	10.85 .26
19.3	46.42 .13	31.55 .16	7.23 .15	45.59 1.67	26.38 .12	46.03 1.14	9.97 .15	9.96 .29
29.3	46.29 .12	31.39 .15	7.08 .14	47.29 1.71	26.25 .12	44.87 1.18	9.82 .14	9.07 .28
June 8.2	46.17 - .11	31.25 - .13	6.94 - .13	49.00 +1.80	26.13 - .11	43.68 -1.21	9.68 - .13	8.20 - .25

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	η Octantis.	ρ^3 Leonis.	ψ Urs. Maj.	ν Urs. Maj.	ξ Hydræ.	χ Urs. Maj.	π Virginis.	ϵ Corvi.
	174° 0' h m 11 0	87° 27' h m 11 1	44° 54' h m 11 3	56° 18' h m 11 12	121° 15' h m 11 27	41° 36' h m 11 40	82° 46' h m 11 55	112° 0' h m 12 4
Feb. 8.6	15.95 + .06	18.08 + .15	29.30 + .31	33.04 + .29	36.13 + .19	15.38 + .31	14.50 + .29	28.41 + .23
18.6	16.44 + .32	18.22 .12	29.49 .16	33.23 .16	36.30 .15	15.65 .23	14.70 .17	28.62 .19
28.5	16.59 - .01	18.33 .08	29.63 .11	33.35 .10	36.43 .10	15.84 .15	14.85 .13	28.78 .14
Mar. 10.5	16.42 .34	18.38 + .03	29.71 .06	33.44 .05	36.50 .05	15.96 .02	14.96 .09	28.90 .10
20.5	15.90 .06	18.40 - .01	29.74 + .01	33.46 + .01	36.53 + .01	16.03 + .04	15.03 .06	28.97 .06
30.4	15.11 - .34	18.37 - .04	29.73 - .03	33.45 - .03	36.53 - .03	16.04 - .08	15.08 + .03	28.99 + .02
Apr. 9.4	14.03 1.20	18.33 .06	29.67 .07	33.39 .07	36.48 .06	15.98 .07	15.08 - .01	29.02 .00
19.4	12.72 1.44	18.25 .08	29.59 .10	33.31 .10	36.41 .08	15.89 .11	15.05 .05	29.00 - .03
29.4	11.16 1.64	18.17 .09	29.48 .12	33.19 .12	36.32 .10	15.76 .15	14.99 .07	28.96 .06
May 9.3	9.44 1.79	18.07 .10	29.35 .13	33.07 .13	36.20 .12	15.59 .17	14.92 .08	28.86 .08
19.3	7.59 -1.90	17.96 - .11	29.21 - .14	32.92 - .14	36.07 - .13	15.41 - .19	14.85 - .09	28.79 - .09
29.3	5.64 1.98	17.85 .11	29.06 .14	32.77 .15	35.94 .14	15.21 .20	14.76 .10	28.70 .10
June 8.3	3.63 2.00	17.74 .10	28.92 .13	32.63 .14	35.78 .15	15.00 .20	14.65 .11	28.59 .11
18.2	1.64 -1.97	17.64 - .09	28.79 - .12	32.50 - .12	35.64 - .14	14.81 - .19	14.55 - .10	28.48 - .11
Mean Solar Date.	2 Can. Ven.	6 Urs. Min.	δ^2 Corvi.	β Can. Ven.	γ Virginis, (mean.)	31 Comæ Bereniceæ.	γ Cassiop., S. P.	43 Cephei, S. P.
	48° 43' h m 12 10	1° 41' h m 12 14	105° 54' h m 12 24	48° 2' h m 12 28	90° 50' h m 12 36	61° 51' h m 12 46	330° 7' h m 12 50	355° 40' h m 12 53
Feb. 8.6	37.44 + .29	51.37 +5.84	10.75 + .34	31.66 + .32	5.39 + .25	20.83 + .27	2.01 - .33	36.97 -2.42
18.6	37.71 .24	56.61 4.63	10.97 .20	31.95 .26	5.62 .20	21.09 .24	1.72 .25	34.76 2.00
28.6	37.93 .18	60.63 3.39	11.14 .16	32.18 .20	5.80 .16	21.32 .20	1.51 .18	32.97 1.58
Mar. 10.5	38.08 .12	63.38 2.04	11.28 .12	32.36 .14	5.94 .12	21.49 .16	1.37 .11	31.60 1.11
20.5	38.18 .07	64.70 +0.02	11.39 .08	32.47 .09	6.05 .10	21.63 .11	1.22 - .04	30.75 .59
30.5	38.23 + .02	64.63 -0.76	11.46 + .04	32.55 + .04	6.14 + .07	21.71 + .07	1.23 + .04	30.43 - .01
Apr. 9.5	38.23 - .02	63.19 2.08	11.48 + .01	32.56 - .01	6.18 + .03	21.77 + .03	1.37 .12	30.73 + .54
19.4	38.19 .06	60.47 3.31	11.47 - .02	32.54 .05	6.19 - .01	21.77 - .01	1.54 .20	31.51 1.05
29.4	38.12 .10	56.58 4.28	11.45 .04	32.47 .06	6.17 .02	21.76 .04	1.78 .29	32.83 1.54
May 9.4	38.00 .13	51.72 5.97	11.40 .06	32.38 .11	6.15 .04	21.70 .06	2.12 .37	34.58 1.95
19.3	37.87 - .15	46.05 -5.97	11.33 - .07	32.25 - .14	6.09 - .06	21.64 - .06	2.51 + .41	36.72 +2.30
29.3	37.71 .16	39.78 6.46	11.25 .08	32.10 .16	6.02 .07	21.54 .10	2.94 .46	39.19 2.59
June 8.3	37.55 .17	33.13 6.75	11.16 .09	31.94 .17	5.94 .09	21.44 .11	3.43 .51	41.89 2.78
18.2	37.38 - .17	26.29 -6.85	11.06 - .10	31.77 - .17	5.84 - .10	21.32 - .12	3.96 + .55	44.74 +2.87

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Mean Solar Date.	δ Muscæ.	ϵ Virginis.	γ Can. Ven.	κ Octantis.	B.A.C. 4536.	π Virginis.	θ Apodis.	π Hydræ.
	160° 57' h m 12 54	78° 27' h m 12 56	48° 51' h m 13 12	175° 13' h m 13 23	52° 15' h m 13 29	98° 9' h m 13 35	166° 16' h m 13 54	116° 9' h m 14 0
Feb. 28.6	45.56 + .42	42.67 + .18	37.50 + .36	25.07 +1.81	53.83 + .98	50.72 + .23	40.24 + .80	6.75 + .24
Mar. 10.6	45.93 .32	42.84 .15	37.73 .20	26.70 1.45	54.08 .92	50.92 .18	40.98 .68	6.98 .22
20.6	46.21 .23	42.98 .11	37.90 .15	27.97 1.08	54.25 .16	51.08 .15	41.60 .55	7.20 .19
30.5	46.38 .12	43.07 .06	38.02 .10	28.85 .69	54.40 .12	51.22 .19	42.08 .42	7.36 .15
Apr. 9.5	46.46 + .02	43.14 .05	38.10 .05	29.35 + .32	54.50 .08	51.33 .09	42.44 .29	7.49 .12
19.5	46.44 - .06	43.17 + .01	38.13 + .01	29.48 - .07	54.55 + .03	51.40 + .06	42.66 + .16	7.60 + .09
29.5	46.34 .15	43.16 - .02	38.12 - .03	29.21 .46	54.56 - .01	51.44 + .03	42.76 + .03	7.68 .06
May 9.4	46.14 .24	43.14 .04	38.07 .07	28.56 .84	54.54 .04	51.46 .00	42.72 - .10	7.72 + .03
19.4	45.87 .31	43.10 .06	37.98 .10	27.52 1.19	54.48 .07	51.45 - .02	42.55 .23	7.74 .00
29.4	45.53 .37	43.03 .07	37.88 .12	25.19 1.48	54.40 .10	51.42 .04	42.26 .35	7.72 - .03
June 8.3	45.13 - .43	42.95 - .08	37.74 - .15	23.55 -1.78	54.28 - .12	51.37 - .06	41.86 - .46	7.69 - .05
18.3	44.66 .48	42.87 .09	37.58 .17	21.62 2.03	54.16 .14	51.31 .08	41.33 .56	7.62 .07
28.3	44.15 .51	42.76 .10	37.41 .17	19.50 2.21	54.00 .16	51.22 .09	40.73 .64	7.54 .08
July 8.3	43.65 - .49	42.65 - .11	37.24 - .18	17.21 -2.33	53.84 - .17	51.12 - .10	40.05 - .71	7.43 - .11
Mean Solar Date.	64° 23' h m 14 5	99° 45' h m 14 7	11° 56' h m 14 9	173° 9' h m 14 9	43° 24' h m 14 12	102° 52' h m 14 13	190° 24' h m 14 33	168° 34' h m 14 34
Mar. 20.6	23.86 + .19	2.39 + .17	22.45 + .63	28.75 +1.16	13.42 + .24	10.14 + .18	55.52 - .77	17.57 + .83
30.6	24.03 .14	2.54 .15	22.97 .43	29.76 .99	13.63 .18	10.31 .15	54.81 .64	18.34 .70
Apr. 9.5	24.15 .10	2.68 .12	23.31 .24	30.59 .66	13.78 .13	10.45 .13	54.25 .47	18.97 .55
19.5	24.24 .07	2.78 .09	23.45 + .06	31.11 .39	13.88 .08	10.57 .10	53.88 .27	19.44 .39
29.5	24.31 .06	2.86 .06	23.43 - .13	31.37 + .12	13.94 + .03	10.65 .07	53.71 - .08	19.76 .23
May 9.4	24.34 + .02	2.90 + .03	23.20 - .31	31.35 - .15	13.95 - .08	10.71 + .04	53.72 + .12	19.90 + .07
19.4	24.33 - .01	2.93 + .01	22.82 .46	31.07 .42	13.91 .06	10.73 + .01	53.94 .31	19.90 - .09
29.4	24.29 .04	2.93 - .02	22.28 .60	30.51 .69	13.83 .10	10.74 - .01	54.34 .50	19.72 .26
June 8.4	24.24 .07	2.90 .04	21.62 .72	29.69 .33	13.72 .14	10.71 .03	54.94 .68	19.39 .41
18.3	24.16 .09	2.85 .06	20.85 .81	28.65 1.14	13.56 .17	10.67 .05	55.70 .83	18.90 .55
28.3	24.06 - .11	2.78 - .08	20.00 - .80	27.41 -1.32	13.39 - .19	10.60 - .08	56.60 + .26	18.29 - .68
July 8.3	23.94 .13	2.69 .10	19.08 .94	26.01 1.48	13.19 .20	10.51 .10	57.62 1.09	17.55 .79
18.3	23.81 .15	2.58 .11	18.12 .97	24.46 1.61	12.98 .22	10.40 .11	58.75 1.17	16.71 .88
28.2	23.65 - .16	2.46 - .12	17.14 - .98	22.80 -1.70	12.75 - .23	10.28 - .12	59.95 +1.21	15.80 - .23

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	33 Bootia.	47 Cephei, S. P.	γ Scorpii.	δ Bootia.	ρ Octantia.	β Cor. Bor.	γ Camelop., S. P.	δ Apodia.
	45° 7' h m 14 34	348° 59' h m 14 51	114° 51' h m 14 57	56° 16' h m 15 11	174° 6' h m 15 18	60° 31' h m 15 23	340° 59' h m 15 38	168° 25' h m 16 3
Mar. 30.6	46.01 + .19	22.17 - .59	39.77 + .39	5.14 + .39	8.78 + 1.73	18.54 + .23	41.57 - .42	58.74 + 1.07
Apr. 9.6	46.18 .15	21.75 .39	39.97 .18	5.34 .18	10.36 1.43	18.75 .19	41.21 .39	59.76 .96
19.5	46.31 .11	21.53 - .11	39.13 .16	5.49 .14	11.65 1.14	18.91 .15	41.00 .15	60.66 .83
29.5	46.39 .08	21.52 + .19	39.28 .13	5.62 .11	12.64 .83	19.06 .19	40.91 - .03	61.41 .68
May 9.5	46.44 + .08	21.74 .33	39.38 .09	5.71 .07	13.31 .51	19.16 .08	40.94 + .09	62.02 .53
19.5	46.43 - .03	22.19 + .54	39.46 + .06	5.76 + .03	13.66 + .18	19.23 + .05	41.10 + .32	62.47 + .37
29.4	46.38 .07	22.81 .78	39.51 + .03	5.78 .09	13.66 - .16	19.27 + .01	41.39 .35	62.75 .19
June 8.4	46.29 .10	23.60 .08	39.52 - .01	5.76 - .04	13.33 .49	19.26 - .02	41.80 .47	62.85 + .02
18.4	46.18 .13	24.56 1.09	39.49 .04	5.70 .07	12.88 .80	19.22 .05	42.33 .56	62.78 - .16
28.4	46.03 .17	25.66 1.14	39.45 .07	5.62 .10	11.73 1.10	19.16 .08	42.92 .64	62.52 .34
July 8.3	45.84 - .30	26.84 + 1.21	39.37 - .09	5.50 - .13	10.47 - 1.38	19.06 - .11	43.60 + .73	62.10 - .48
18.3	45.63 .91	26.08 1.36	39.27 .11	5.35 .15	8.98 1.61	18.93 .14	44.35 .77	61.56 .68
28.3	45.42 .29	29.35 1.26	39.15 .13	5.19 .17	7.26 1.79	18.78 .16	45.13 .79	60.85 .77
Aug. 7.3	45.18 .33	30.64 1.28	39.00 .15	5.01 .19	5.41 1.88	18.61 .18	45.93 .80	60.03 .86
17.2	44.95 .33	31.90 1.25	38.84 .16	4.81 .30	3.50 1.91	18.42 .19	46.73 .79	59.13 .93
27.2	44.72 - .39	33.13 + 1.39	38.67 - .17	4.61 - .19	1.59 - 1.88	18.23 - .19	47.52 + .77	58.18 - .96
Mean Solar Date.	ϕ Herculis.	σ Cor. Bor. (mean.)	γ Apodia.	η Ura. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 46' h m 16 5	55° 51' h m 16 10	168° 39' h m 16 16	13° 59' h m 16 20	105° 35' h m 17 4	53° 4' h m 17 11	114° 53' h m 17 15	150° 35' h m 17 21
Apr. 9.6	19.30 + .34	34.49 + .34	40.07 + 1.02	47.56 + .65	4.64 + .38	13.70 + .29	15.68 + .39	11.18 + .53
19.6	19.53 .31	34.71 .30	41.03 .90	48.14 .51	4.91 .25	13.98 .26	15.98 .28	11.69 .49
29.6	19.73 .17	34.89 .16	41.86 .75	48.58 .37	5.15 .23	14.23 .23	16.24 .25	12.16 .45
May 9.6	19.87 .19	35.03 .14	42.53 .60	48.88 .29	5.37 .20	14.44 .20	16.48 .23	12.59 .40
19.5	19.98 .08	35.16 .10	43.06 .44	49.01 + .06	5.56 .18	14.62 .16	16.70 .20	12.96 .34
29.5	20.04 + .04	35.23 + .06	43.41 + .36	49.00 - .09	5.73 + .15	14.76 + .12	16.88 + .17	13.28 + .28
June 8.5	20.05 - .01	35.25 + .08	43.57 + .07	48.83 .24	5.86 .11	14.85 .08	17.04 .14	13.53 .21
18.4	20.02 .06	35.26 - .08	43.55 - .11	48.52 .38	5.96 .08	14.91 + .04	17.16 .10	13.70 .13
28.4	19.93 .11	35.22 .06	43.36 .38	48.06 .52	6.02 + .04	14.92 - .01	17.23 .06	13.80 + .06
July 8.4	19.80 .15	35.14 .10	42.99 .46	47.48 .64	6.03 .00	14.89 .05	17.27 + .01	13.82 - .01
18.4	19.63 - .18	35.02 - .14	42.45 - .61	46.79 - .74	6.03 - .03	14.82 - .10	17.26 - .03	13.77 - .69
28.3	19.43 .31	34.87 .17	41.77 .74	46.01 .82	5.97 .07	14.69 .15	17.21 .06	13.63 .17
Aug. 7.3	19.21 .34	34.69 .19	40.97 .88	45.16 .88	5.83 .10	14.51 .19	17.13 .10	13.44 .23
17.3	18.96 .36	34.49 .21	40.06 .94	44.25 .93	5.76 .13	14.32 .21	17.00 .14	13.18 .29
27.3	18.69 .27	34.27 .22	39.10 .98	43.31 .95	5.61 .16	14.11 .23	16.84 .17	12.86 .33
Sept. 6.2	18.42 - .37	34.06 - .28	38.11 - .97	42.36 - .94	5.45 - .17	13.87 - .24	16.67 - .18	12.51 - .36
16.2	18.15 .28	33.84 .23	37.15 .93	41.42 .91	5.27 .18	13.63 .26	16.48 .19	12.15 .36
26.2	17.90 .24	33.62 .23	36.24 .86	40.55 .85	5.10 .18	13.38 .24	16.30 .18	11.78 .26
Oct. 6.2	17.68 - .21	33.38 - .24	35.43 - .78	39.73 - .76	4.96 - .13	13.15 - .29	16.13 - .17	11.44 - .24

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
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Mean Solar Date.	Groombr. 944, S.P.	ϵ Herculis.	θ Herculis.	σ Herculis.	λ Sagittarii.	χ Draconis.	ζ Pavonis.	γ Lyrae.
	355° 8' h m 17 26	43° 56' h m 17 36	52° 44' h m 17 52	61° 15' h m 18 3	115° 29' h m 18 21	17° 19' h m 18 23	161° 31' h m 18 30	57° 28' h m 18 54
May 19.6	33.86 - .46	23.53 + .18	30.36 + .90	16.49 + .91	12.24 + .95	6.03 + .43	14.25 + .64	50.96 + .95
29.6	33.62 - .01	23.69 .14	30.54 .15	16.68 .17	12.48 .23	6.40 .31	14.86 .57	51.20 .22
June 8.5	33.84 + .46	23.81 .10	30.67 .11	16.83 .13	12.70 .90	6.65 .19	15.40 .47	51.41 .18
18.5	34.54 .92	23.88 + .05	30.77 .07	16.94 .09	12.88 .16	6.77 + .06	15.82 .36	51.57 .14
28.5	35.67 1.34	23.91 - .01	30.82 + .03	17.02 .06	13.02 .19	6.76 - .07	16.12 .94	51.69 .10
July 8.5	37.21 + 1.73	23.87 - .07	30.83 - .01	17.06 + .09	13.12 + .07	6.62 - .90	16.29 + .19	51.77 + .06
18.4	39.13 2.06	23.78 .19	30.79 .06	17.05 - .03	13.17 + .02	6.37 .39	16.36 .00	51.81 + .01
28.4	41.32 2.36	23.64 .17	30.71 .11	16.99 .08	13.17 - .02	6.01 .43	16.29 - .13	51.79 - .04
Aug. 7.4	43.84 2.63	23.45 .91	30.57 .16	16.89 .19	13.14 .06	5.53 .53	16.10 .95	51.74 .09
17.4	46.57 2.81	23.23 .94	30.39 .19	16.75 .15	13.06 .10	4.95 .61	15.80 .35	51.63 .13
27.3	49.46 + 2.95	22.97 - .37	30.19 - .91	16.58 - .18	12.94 - .14	4.29 - .69	15.40 - .45	51.47 - .17
Sept. 6.3	52.47 3.04	22.69 .99	29.97 .23	16.39 .90	12.77 .17	3.57 .75	14.90 .53	51.29 .19
16.3	55.54 3.06	22.40 .30	29.72 .25	16.18 .91	12.61 .18	2.80 .78	14.35 .57	51.08 .21
26.3	58.60 3.03	22.10 .39	29.47 .25	15.96 .92	12.42 .19	2.01 .80	13.77 .59	50.86 .22
Oct. 6.2	61.59 2.95	21.81 .99	29.22 .94	15.74 .92	12.24 .18	1.20 .80	13.18 .59	50.63 .22
16.2	64.50 + 2.92	21.54 - .96	28.98 - .23	15.53 - .91	12.06 - .17	0.41 - .77	12.59 - .58	50.40 - .22
Mean Solar Date.	ϵ Lyrae.	25 Camelop. S. P.	θ Lyrae.	β Cygni.	β Sagittae.	δ Cygni.	Groombr. 1374, S.P.	ϵ Pavonis.
	54° 4' h m 19 3	352° 37' h m 19 7	52° 4' h m 19 12	62° 16' h m 19 26	72° 47' h m 19 36	45° 8' h m 19 41	344° 13' h m 19 46	163° 12' h m 19 47
May 29.6	24.09 + .94	47.01 - .02	34.41 + .95	18.39 + .94	7.48 + .96	33.69 + .99	58.04 - .96	54.94 + .80
June 8.6	24.31 .90	46.53 .34	34.64 .91	18.62 .92	7.73 .93	33.96 .95	57.74 .93	55.69 .70
18.6	24.49 .15	46.34 - .05	34.83 .16	18.83 .18	7.95 .91	34.19 .90	57.57 - .10	56.35 .60
28.5	24.61 .10	46.44 + .94	34.96 .19	18.98 .13	8.15 .17	34.36 .14	57.53 + .09	56.90 .49
July 8.5	24.70 .06	46.82 .59	35.06 .07	19.09 .09	8.28 .12	34.47 .09	57.62 .15	57.34 .37
18.5	24.73 + .01	47.48 + .80	35.10 + .09	19.17 + .05	8.38 + .06	34.55 + .04	57.84 + .98	57.65 + .23
28.5	24.72 - .04	48.42 1.06	35.10 - .03	19.19 .00	8.45 + .04	34.55 - .09	58.18 .41	57.80 + .08
Aug. 7.4	24.66 .09	49.59 1.97	35.04 .09	19.17 - .04	8.46 - .01	34.51 .08	58.64 .59	57.92 - .05
17.4	24.55 .14	50.96 1.48	34.92 .14	19.11 .06	8.43 .05	34.40 .13	59.21 .61	57.70 .18
27.4	24.39 .18	52.54 1.67	34.76 .18	19.00 .13	8.35 .09	34.25 .17	59.87 .79	57.45 .31
Sept. 6.3	24.20 - .90	54.31 + 1.83	34.57 - .21	18.84 - .17	8.25 - .19	34.05 - .91	60.65 + .81	57.08 - .43
16.3	23.99 .92	56.20 1.94	34.35 .93	18.67 .19	8.11 .15	33.82 .94	61.49 .87	56.58 .53
26.3	23.75 .94	58.18 2.09	34.11 .95	18.47 .90	7.95 .17	33.56 .97	62.39 .93	56.02 .39
Oct. 6.3	23.51 .94	60.24 2.07	33.86 .95	18.26 .91	7.78 .17	33.28 .98	63.35 .98	55.40 .63
16.2	23.27 .93	62.32 2.08	33.61 .94	18.05 .90	7.61 .16	33.00 .98	64.35 1.00	54.76 .65
26.2	23.03 - .91	64.39 + 2.09	33.37 - .93	17.85 - .19	7.44 - .15	32.72 - .97	65.34 + 1.01	54.11 - .64
Nov. 5.2	22.83 - .19	66.43 + 1.96	33.15 - .92	17.66 - .18	7.30 - .13	32.44 - .96	66.36 + .99	53.49 - .69

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	σ Sagittari.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonia.	ψ Capricor.	ϵ Cygni.
	70° 49'	118° 1'	91° 9'	43° 36'	74° 29'	156° 36'	115° 40'	56° 27'
	^h ₁₉ ^m ₅₃	^h ₁₉ ^m ₅₅	^h ₂₀ ^m ₅	^h ₂₀ ^m ₁₀	^h ₂₀ ^m ₃₄	^h ₂₀ ^m ₃₅	^h ₂₀ ^m ₃₉	^h ₂₀ ^m ₄₁
June 18.6	53.50 + .19	55.35 + .25	39.25 + .31	11.93 + .23	33.15 + .23	5.79 + .54	36.42 + .27	47.14 + .26
28.6	53.68 .16	55.59 .21	39.45 .18	12.14 .18	33.37 .20	6.29 .46	36.68 .24	47.38 .22
July 8.5	53.83 .13	55.77 .17	39.62 .15	12.30 .13	33.56 .16	6.72 .39	36.91 .21	47.58 .17
18.5	53.94 .09	55.93 .13	39.75 .11	12.41 .07	33.70 .12	7.07 .30	37.10 .17	47.72 .12
28.5	54.00 + .04	56.03 .08	39.85 .07	12.44 + .01	33.80 .08	7.33 .20	37.24 .12	47.82 .07
Aug. 7.5	54.03 .00	56.09 + .03	39.89 + .02	12.44 - .04	33.86 + .04	7.46 + .09	37.34 + .07	47.87 + .02
17.4	54.00 - .04	56.08 - .02	39.89 - .02	12.37 .10	33.80 .00	7.49 - .01	37.38 + .02	47.87 - .02
27.4	53.93 .09	56.03 .06	39.85 .06	12.25 .15	33.86 - .05	7.43 .19	37.38 - .03	47.83 .07
Sept. 6.4	53.82 .13	55.95 .10	39.78 .09	12.06 .20	33.79 .09	7.25 .22	37.33 .07	47.73 .11
16.4	53.69 .15	55.82 .14	39.67 .12	11.85 .23	33.69 .12	6.99 .30	37.25 .11	47.60 .15
26.3	53.51 - .17	55.66 - .17	39.53 - .15	11.60 - .26	33.55 - .15	6.66 - .36	37.12 - .14	47.42 - .18
Oct. 6.3	53.34 .18	55.49 .18	39.37 .16	11.33 .28	33.39 .16	6.27 .41	36.97 .16	47.24 .20
16.3	53.16 .19	55.31 .18	39.22 .16	11.04 .29	33.23 .17	5.84 .44	36.80 .17	47.03 .21
26.3	52.97 .18	55.13 .17	39.06 .15	10.76 .28	33.06 .16	5.39 .45	36.64 .17	46.83 .21
Nov. 5.2	52.80 .16	54.97 .15	38.91 .14	10.48 .27	32.90 .15	4.94 .43	36.47 .16	46.62 .20
15.2	52.66 - .14	54.84 - .12	38.78 - .12	10.22 - .25	32.76 - .14	4.52 - .40	36.34 - .14	46.42 - .19
25.2	52.55 - .11	54.73 - .09	38.68 - .09	9.98 - .23	32.62 - .13	4.14 - .36	36.20 - .13	46.24 - .17
Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ Octantis.	ζ Chamele- ontis, S.P.	π^1 Cygni.	16 Pegasi.	π Pegasi.
	52° 26'	112° 53'	50° 5'	173° 14'	189° 33'	41° 12'	64° 36'	57° 22'
	^h ₂₁ ^m ₁₀	^h ₂₁ ^m ₂₀	^h ₂₁ ^m ₃₂	^h ₂₁ ^m ₃₄	^h ₂₁ ^m ₃₆	^h ₂₁ ^m ₄₂	^h ₂₁ ^m ₄₈	^h ₂₂ ^m ₅
July 8.6	25.91 + .20	25.03 + .24	34.23 + .23	9.61 + 1.45	59.43 - .21	45.73 + .28	5.05 + .24	7.74 + .28
18.6	26.09 .16	25.25 .20	34.44 .18	10.92 1.17	58.67 .68	45.97 .21	5.27 .19	7.98 .21
28.5	26.22 .11	25.43 .15	34.59 .13	11.95 .88	58.07 .49	46.14 .15	5.44 .14	8.17 .16
Aug. 7.5	26.31 + .08	25.56 .10	34.71 .09	12.68 .56	57.70 .27	46.26 .09	5.56 .10	8.31 .12
17.5	26.34 .00	25.64 .05	34.76 + .03	13.07 + .22	57.54 - .06	46.32 + .03	5.65 .06	8.41 .07
27.5	26.31 - .05	25.67 + .01	34.76 - .02	13.13 - .11	57.59 + .18	46.31 - .02	5.69 + .02	8.46 + .02
Sept. 6.4	26.24 .09	25.67 - .02	34.71 .07	12.85 .44	57.91 .29	46.27 .07	5.68 - .03	8.46 - .02
16.4	26.13 .13	25.62 .07	34.62 .11	12.25 .77	58.43 .23	46.17 .13	5.63 .07	8.43 .06
26.4	25.97 .17	25.52 .10	34.49 .15	11.31 1.07	59.16 .23	45.99 .19	5.54 .10	8.35 .10
Oct. 6.4	25.79 .20	25.41 .13	34.31 .19	10.12 1.30	60.09 1.02	45.79 .22	5.42 .13	8.24 .13
16.3	25.58 - .21	25.27 - .15	34.11 - .21	8.71 - 1.48	61.20 + 1.17	45.56 - .24	5.20 - .15	8.09 - .16
26.3	25.37 .21	25.11 .16	33.90 .22	7.16 1.60	62.43 1.26	45.32 .25	5.12 .17	7.92 .17
Nov. 5.3	25.16 .21	24.95 .15	33.69 .22	5.51 1.63	63.73 1.33	45.06 .27	4.96 .17	7.75 .18
15.3	24.96 .20	24.81 .14	33.47 .21	3.85 1.64	65.09 1.35	44.78 .27	4.79 .16	7.57 .18
25.2	24.75 .19	24.68 .13	33.27 .20	2.22 1.58	66.43 1.31	44.52 .28	4.65 .14	7.39 .17
Dec. 5.2	24.57 - .17	24.56 - .12	33.07 - .19	0.69 - 1.45	67.70 + 1.22	44.27 - .24	4.51 - .12	7.23 - .15

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.								
Mean Solar Date.	ν Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pegasi.	Groombr. 1706, S.P.
	176° 32'	91° 57'	101° 15'	40° 17'	51° 32'	171° 58'	67° 1'	348° 22'
	$\begin{smallmatrix} h & m \\ 22 & 10 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 15 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 24 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 26 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 34 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 34 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 41 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 22 & 51 \end{smallmatrix}$
July 8.6	43.49 +3.08	59.97 + .26	50.96 + .26	47.30 + .32	21.05 + .29	53.91 +1.40	15.35 + .27	5.92 - .64
18.6	46.33 2.80	60.21 .22	51.21 .23	47.60 .27	21.32 .25	55.27 1.28	15.61 .24	5.35 .50
28.6	48.68 2.09	60.41 .18	51.43 .20	47.85 .21	21.55 .21	56.47 1.06	15.84 .20	4.93 .26
Aug. 7.6	50.50 1.52	60.57 .14	51.62 .16	48.02 .15	21.73 .16	57.43 .84	16.02 .16	4.63 .24
17.5	51.72 .90	60.70 .10	51.74 .11	48.15 .10	21.87 .11	58.15 .58	16.15 .12	4.46 - .10
27.5	52.30 + .25	60.78 + .06	51.83 + .07	48.21 + .04	21.95 + .06	58.59 + .30	16.25 + .08	4.44 + .05
Sept. 6.5	52.22 - .42	60.82 + .02	51.89 + .03	48.23 - .01	21.98 + .01	58.75 + .01	16.31 + .04	4.57 .21
16.5	51.46 1.05	60.82 - .08	51.90 - .01	48.19 .07	21.97 - .03	58.61 - .28	16.32 - .01	4.87 .26
26.4	50.12 1.65	60.78 .05	51.87 .04	48.09 .12	21.92 .07	58.18 .56	16.29 .05	5.33 .23
Oct. 6.4	48.17 2.21	60.72 .08	51.81 .07	47.96 .17	21.82 .11	57.50 .79	16.23 .08	5.93 .67
16.4	45.70 -2.66	60.63 - .10	51.73 - .10	47.76 - .20	21.69 - .14	56.60 -1.00	16.13 - .10	6.66 + .21
26.3	42.85 3.01	60.52 .11	51.61 .12	47.56 .22	21.54 .16	55.50 1.18	16.03 .12	7.57 .25
Nov. 5.3	39.68 3.25	60.40 .12	51.50 .12	47.33 .24	21.37 .18	54.24 1.31	15.90 .13	8.57 1.08
15.3	36.36 3.34	60.27 .12	51.37 .13	47.07 .26	21.17 .19	52.88 1.38	15.77 .14	9.69 1.17
25.3	33.00 3.22	60.16 .12	51.24 .12	46.82 .26	20.99 .19	51.47 1.39	15.62 .15	10.91 1.23
Dec. 5.2	29.73 -3.15	60.04 - .11	51.13 - .11	46.56 - .25	20.80 - .19	50.10 -1.35	15.48 - .14	12.16 +1.28
15.2	26.70 -2.85	59.94 - .09	51.02 - .10	46.32 - .23	20.61 - .18	48.77 -1.28	15.35 - .13	13.43 +1.24
Mean Solar Date.	α Androm.	ϕ Aquarii.	τ Pegasi.	λ Androm.	δ Aquarii.	δ Sculptoris.	γ Octantis.	33 Piscium.
	48° 16'	96° 39'	66° 52'	44° 9'	108° 54'	118° 45'	172° 38'	96° 20'
	$\begin{smallmatrix} h & m \\ 22 & 56 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 8 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 15 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 32 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 38 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 43 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 45 \end{smallmatrix}$	$\begin{smallmatrix} h & m \\ 23 & 59 \end{smallmatrix}$
July 28.6	53.59 + .25	39.33 + .23	13.30 + .22	12.79 + .28	31.51 + .27	13.57 + .29	45.23 +1.48	43.86 + .25
Aug. 7.6	53.81 .19	39.54 .19	13.51 .19	13.06 .24	31.76 .23	13.84 .24	46.62 1.29	44.10 .23
17.6	53.97 .14	39.71 .15	13.69 .15	13.28 .19	31.97 .18	14.06 .20	47.80 1.06	44.32 .20
27.5	54.08 .09	39.84 .11	13.81 .10	13.43 .14	32.13 .14	14.25 .16	48.73 .79	44.50 .16
Sept. 6.5	54.15 + .04	39.93 .07	13.90 .06	13.55 .10	32.26 .11	14.39 .12	49.37 .49	44.63 .12
16.5	54.16 - .01	39.99 + .04	13.95 + .03	13.62 + .04	32.35 + .07	14.48 + .07	49.71 + .20	44.73 + .09
26.5	54.13 .05	40.00 .00	13.97 .00	13.63 - .01	32.40 + .03	14.53 + .03	49.76 - .12	44.81 .05
Oct. 6.4	54.06 .09	39.99 - .03	13.94 - .04	13.61 .05	32.40 - .01	14.55 - .01	49.47 .43	44.83 + .01
16.4	53.95 .12	39.94 .06	13.89 .07	13.54 .09	32.36 .04	14.51 .05	48.89 .72	44.83 - .08
26.4	53.82 .15	39.87 .08	13.80 .10	13.43 .13	32.32 .06	14.45 .08	48.03 .28	44.80 .05
Nov. 5.4	53.64 - .18	39.77 - .10	13.70 - .11	13.29 - .16	32.24 - .09	14.36 - .10	46.92 -1.21	44.74 - .07
15.3	53.46 .19	39.67 .11	13.58 .12	13.11 .18	32.14 .11	14.25 .12	45.62 1.28	44.67 .06
25.3	53.27 .20	39.56 .11	13.45 .13	12.92 .19	32.03 .12	14.13 .13	44.17 1.49	44.58 .09
Dec. 5.3	53.06 .20	39.45 .10	13.32 .13	12.72 .20	31.91 .12	13.99 .14	42.64 1.56	44.48 .10
15.3	52.87 .19	39.34 .10	13.19 .13	12.51 .21	31.80 .12	13.86 .14	41.06 1.57	44.38 .11
25.2	52.69 - .19	39.25 - .09	13.06 - .12	12.30 - .21	31.68 - .11	13.72 - .13	39.51 -1.20	44.27 - .11
35.2	52.50 - .18	39.17 - .08	12.94 - .11	12.09 - .21	31.58 - .09	13.59 - .12	38.06 -1.20	44.16 - .10

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Jan. 1	18 49 11.67	12.40	-22 58 17.6	16.8	11.030	+12.98	+ 3 59.95	16 18.43	1 11.07	18 45 11.79
2	18 53 36.20	37.03	22 52 52.8	51.8	11.014	14.11	4 27.94	16 18.43	1 11.02	18 49 8.35
3	18 58 0.36	1.27	22 46 60.7	59.5	10.997	15.23	4 55.54	16 18.43	1 10.97	18 53 4.91
4	19 2 24.11	25.10	22 40 41.4	40.0	10.980	16.36	5 22.73	16 18.42	1 10.91	18 57 1.47
5	19 6 47.41	48.48	22 33 55.2	53.6	10.961	17.48	5 49.49	16 18.40	1 10.85	19 0 58.03
6	19 11 10.26	11.41	-22 26 42.3	40.4	10.942	+18.59	+ 6 15.79	16 18.37	1 10.79	19 4 54.59
7	19 15 32.63	33.85	22 19 2.9	0.7	10.922	19.68	6 41.60	16 18.34	1 10.72	19 8 51.14
8	19 19 54.49	55.78	22 10 57.2	54.7	10.900	20.77	7 6.91	16 18.30	1 10.65	19 12 47.70
9	19 24 15.83	17.19	22 2 25.4	22.6	10.878	21.85	7 31.70	16 18.26	1 10.57	19 16 44.26
10	19 28 36.63	38.06	21 53 27.8	24.7	10.855	22.93	7 55.94	16 18.21	1 10.49	19 20 40.82
11	19 32 56.86	58.36	-21 44 4.6	1.2	10.831	+23.99	+ 8 19.62	16 18.16	1 10.41	19 24 37.37
12	19 37 16.50	18.07	21 34 16.1	12.4	10.806	25.04	8 42.71	16 18.10	1 10.33	19 28 33.93
13	19 41 35.53	37.16	21 23 62.7	58.6	10.780	26.08	9 5.18	16 18.04	1 10.25	19 32 30.49
14	19 45 53.93	55.62	21 13 24.4	20.1	10.753	27.10	9 27.02	16 17.96	1 10.16	19 36 27.05
15	19 50 11.69	13.44	21 2 21.7	17.1	10.726	28.11	9 48.23	16 17.88	1 10.07	19 40 23.60
16	19 54 28.79	30.60	-20 50 54.8	49.9	10.698	+29.11	+10 8.77	16 17.80	1 9.97	19 44 20.16
17	19 58 45.19	47.05	20 38 64.1	58.8	10.669	30.10	10 28.62	16 17.72	1 9.87	19 48 16.71
18	20 3 0.88	2.79	20 26 49.9	44.3	10.640	31.08	10 47.76	16 17.63	1 9.77	19 52 13.27
19	20 7 15.96	17.82	20 14 12.6	6.7	10.609	32.03	11 6.17	16 17.54	1 9.67	19 56 9.83
20	20 11 30.09	32.10	20 1 12.4	6.2	10.578	32.98	11 23.84	16 17.44	1 9.56	20 0 6.39
21	20 15 43.57	45.62	-19 47 49.7	43.2	10.546	+33.91	+11 40.76	16 17.34	1 9.46	20 4 2.94
22	20 19 56.27	58.36	19 33 65.0	58.1	10.514	34.88	11 56.90	16 17.24	1 9.35	20 7 59.50
23	20 24 8.18	10.31	19 19 58.5	51.3	10.481	35.79	12 12.26	16 17.14	1 9.24	20 11 56.06
24	20 28 19.29	21.45	19 5 30.6	23.0	10.447	36.60	12 26.80	16 17.03	1 9.13	20 15 52.62
25	20 32 29.58	31.78	18 50 41.7	33.8	10.413	37.46	12 40.53	16 16.91	1 9.02	20 19 49.17
26	20 36 39.05	41.28	-18 35 32.3	24.1	10.378	+38.31	+12 53.44	16 16.79	1 8.91	20 23 45.73
27	20 40 47.70	49.96	18 19 62.9	54.3	10.343	39.15	13 5.52	16 16.67	1 8.80	20 27 42.28
28	20 44 55.51	57.79	18 4 13.4	4.6	10.308	39.98	13 16.77	16 16.55	1 8.68	20 31 38.84
29	20 49 2.48	4.78	17 47 64.7	55.6	10.273	40.76	13 27.18	16 16.42	1 8.57	20 35 35.39
30	20 53 8.61	10.93	17 31 37.1	27.7	10.238	41.54	13 36.75	16 16.29	1 8.45	20 39 31.95
31	20 57 13.90	16.24	-17 14 50.9	41.2	10.203	+42.31	+13 45.48	16 16.15	1 8.34	20 43 28.50
Feb. 1	21 1 18.35	20.70	16 57 46.5	36.5	10.168	43.08	13 53.37	16 16.01	1 8.22	20 47 25.06
2	21 5 21.96	24.32	16 40 24.3	14.0	10.134	43.78	14 0.42	16 15.86	1 8.11	20 51 21.61
3	21 9 24.75	27.12	16 22 44.8	34.3	10.100	44.50	14 6.64	16 15.71	1 7.99	20 55 18.17
4	21 13 26.72	29.10	16 4 48.3	37.6	10.066	45.20	14 12.05	16 15.54	1 7.88	20 59 14.72
5	21 17 27.88	30.26	-15 46 35.3	21.4	10.032	+45.87	+14 16.64	16 15.37	1 7.76	21 3 11.28
6	21 21 28.23	30.61	15 27 66.2	55.1	9.998	46.54	14 20.43	16 15.20	1 7.65	21 7 7.83
7	21 25 27.78	30.16	15 9 21.3	10.0	9.965	47.19	14 23.42	16 15.02	1 7.53	21 11 4.39
8	21 29 26.55	28.93	14 50 20.9	9.4	9.933	47.80	14 25.62	16 14.84	1 7.42	21 15 0.94
9	21 33 24.54	26.92	14 30 65.6	53.9	9.901	48.44	14 27.05	16 14.66	1 7.31	21 18 57.50
10	21 37 21.77	24.15	-14 11 35.8	23.9	9.869	+49.04	+14 27.72	16 14.47	1 7.20	21 22 54.05
11	21 41 18.25	20.62	13 51 51.8	39.8	9.836	49.68	14 27.63	16 14.28	1 7.09	21 26 50.61
12	21 45 13.98	16.34	13 31 54.1	42.0	9.807	50.19	14 26.80	16 14.08	1 6.98	21 30 47.16
13	21 49 8.97	11.32	13 11 43.1	30.9	9.777	50.74	14 25.23	16 13.88	1 6.87	21 34 43.72
14	21 53 3.23	5.57	12 51 19.1	6.8	9.747	51.27	14 22.95	16 13.68	1 6.76	21 38 40.27
15	21 56 56.78	59.10	-12 30 42.6	30.2	9.717	+51.79	+14 19.94	16 13.47	1 6.66	21 42 36.83
16	22 0 49.62	51.93	-12 9 53.9	41.4	9.687	+52.28	+14 16.21	16 13.26	1 6.56	21 46 33.38

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Feb. 16	22 0 49.62	51.93	-12 9 53.9	41.4	9.687	+59.98	+14 16.21	16 13.26	1 6.56	21 46 33.38
17	22 4 41.77	44.06	11 48 53.5	41.0	9.658	52.76	14 11.78	16 13.04	1 6.46	21 50 29.94
18	22 8 33.22	35.49	11 27 42.0	29.4	9.630	53.21	14 6.67	16 12.82	1 6.36	21 54 26.49
19	22 12 23.99	26.24	11 6 19.7	7.1	9.602	53.65	14 0.89	16 12.60	1 6.26	21 58 23.05
20	22 16 14.09	16.31	10 44 46.9	34.3	9.574	54.08	13 54.43	16 12.38	1 6.16	22 2 19.60
21	22 20 3.54	5.73	-10 22 64.1	51.5	9.547	+54.48	+13 47.31	16 12.16	1 6.07	22 6 16.15
22	22 23 52.34	54.50	10 0 71.8	59.2	9.520	54.87	13 39.56	16 11.94	1 5.98	22 10 12.70
23	22 27 40.50	42.63	9 38 70.4	57.9	9.494	55.24	13 31.16	16 11.71	1 5.89	22 14 9.26
24	22 31 28.04	30.14	9 16 60.4	47.9	9.469	55.59	13 22.14	16 11.49	1 5.80	22 18 5.81
25	22 35 14.97	17.04	8 54 42.1	29.7	9.444	55.93	13 12.51	16 11.26	1 5.71	22 22 2.37
26	22 39 1.31	3.35	-8 32 15.9	3.6	9.420	+56.25	+13 2.30	16 11.03	1 5.62	22 25 58.92
27	22 42 47.08	49.09	8 9 42.3	30.1	9.396	56.55	12 51.52	16 10.80	1 5.54	22 29 55.47
28	22 46 32.30	34.28	7 46 61.7	49.6	9.373	56.83	12 40.19	16 10.57	1 5.47	22 33 52.02
Mar. 1	22 50 16.99	18.93	7 24 14.5	2.5	9.351	57.10	12 28.32	16 10.33	1 5.40	22 37 48.58
2	22 54 1.15	3.06	7 1 21.0	9.2	9.330	57.38	12 15.92	16 10.09	1 5.33	22 41 45.13
3	22 57 44.81	46.69	-6 38 21.7	10.1	9.310	+57.59	+12 3.03	16 9.84	1 5.26	22 45 41.69
4	23 1 28.01	29.84	6 15 16.9	5.5	9.291	57.80	11 49.67	16 9.60	1 5.19	22 49 38.24
5	23 5 10.76	12.55	5 51 67.0	55.8	9.272	58.00	11 35.86	16 9.35	1 5.13	22 53 34.80
6	23 8 53.08	54.83	5 28 52.5	41.4	9.255	58.19	11 21.62	16 9.09	1 5.07	22 57 31.35
7	23 12 34.99	36.70	5 5 33.7	22.7	9.239	58.37	11 6.99	16 8.83	1 5.01	23 1 27.90
8	23 16 16.53	18.20	-4 42 10.7	0.0	9.224	+58.53	+10 51.97	16 8.57	1 4.95	23 5 24.45
9	23 19 57.71	59.34	4 18 44.0	33.6	9.209	58.68	10 36.59	16 8.30	1 4.90	23 9 21.01
10	23 23 38.55	40.14	3 55 14.1	3.9	9.196	58.81	10 20.88	16 8.03	1 4.85	23 13 17.56
11	23 27 19.09	20.64	3 31 41.3	31.4	9.183	58.92	10 4.87	16 7.76	1 4.81	23 17 14.11
12	23 30 59.34	60.85	3 7 65.9	56.2	9.172	59.02	9 48.56	16 7.49	1 4.76	23 21 10.66
13	23 34 39.31	40.77	-2 44 28.3	18.9	9.161	+59.10	+9 31.98	16 7.22	1 4.72	23 25 7.22
14	23 38 19.03	20.45	2 20 48.9	39.7	9.151	59.17	9 15.15	16 6.95	1 4.68	23 29 3.77
15	23 41 58.53	59.90	1 56 68.0	59.1	9.141	59.23	8 58.10	16 6.67	1 4.64	23 33 0.32
16	23 45 37.82	39.14	1 33 26.0	17.4	9.133	59.27	8 40.84	16 6.40	1 4.61	23 36 56.87
17	23 49 16.91	18.19	1 9 43.2	34.9	9.126	59.29	8 23.39	16 6.12	1 4.58	23 40 53.43
18	23 52 55.83	57.07	-0 45 60.1	52.1	9.119	+59.30	+8 5.76	16 5.85	1 4.56	23 44 49.98
19	23 56 34.60	35.79	0 22 17.1	9.4	9.113	59.28	7 47.97	16 5.57	1 4.54	23 48 46.53
20	0 0 13.23	14.37	+0 1 25.6	33.0	9.107	59.26	7 30.05	16 5.30	1 4.52	23 52 43.08
21	0 3 51.74	52.83	0 25 7.5	14.6	9.102	59.22	7 12.01	16 5.02	1 4.50	23 56 39.64
22	0 7 30.14	31.18	0 48 48.3	55.1	9.098	59.16	6 53.86	16 4.75	1 4.49	0 0 36.19
23	0 11 8.45	9.45	+1 12 27.4	33.9	9.095	+59.09	+6 35.62	16 4.47	1 4.48	0 4 32.75
24	0 14 46.68	47.64	1 36 4.6	10.8	9.093	59.00	6 17.30	16 4.20	1 4.48	0 8 29.30
25	0 18 24.86	25.78	1 59 39.6	45.4	9.091	58.89	5 58.94	16 3.93	1 4.47	0 12 25.85
26	0 22 3.01	3.88	2 23 11.8	17.3	9.090	58.77	5 40.54	16 3.66	1 4.47	0 16 22.40
27	0 25 41.14	41.96	2 46 40.9	46.1	9.089	58.64	5 22.12	16 3.38	1 4.47	0 20 18.96
28	0 29 19.27	20.04	+3 10 6.5	11.4	9.089	+58.49	+5 3.71	16 3.11	1 4.47	0 24 15.51
29	0 32 57.42	58.14	3 33 28.3	32.9	9.090	58.38	4 45.31	16 2.84	1 4.43	0 28 12.06
30	0 36 35.61	36.28	3 56 46.0	50.3	9.092	58.14	4 26.94	16 2.57	1 4.49	0 32 8.61
31	0 40 13.86	14.49	4 19 59.3	63.3	9.095	57.95	4 8.64	16 2.29	1 4.50	0 36 5.17
32	0 43 52.20	52.78	4 43 7.7	11.4	9.099	57.74	3 50.43	16 2.02	1 4.51	0 40 1.72
33	0 47 30.65	31.19	+5 6 11.0	14.4	9.104	+57.52	+3 32.33	16 1.75	1 4.53	0 43 58.27
34	0 51 9.23	9.72	+5 29 8.8	11.9	9.110	+57.28	+3 14.36	16 1.47	1 4.55	0 47 54.82

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Apr. 1	0 43 52.20	52.78	+ 4 43 7.7	11.4	9.099	+57.74	+3 50.43	16 2.02	1 4.51	0 40 1.72
2	0 47 30.65	31.19	5 6 11.0	14.4	9.104	57.52	3 32.33	16 1.75	1 4.53	0 43 58.27
3	0 51 9.23	9.72	5 29 8.8	11.9	9.110	57.28	3 14.36	16 1.47	1 4.55	0 47 54.82
4	0 54 47.95	48.40	5 52 0.7	3.5	9.117	57.03	2 56.53	16 1.19	1 4.58	0 51 51.38
5	0 58 26.84	27.25	6 14 46.6	49.1	9.125	56.77	2 38.87	16 0.91	1 4.61	0 55 47.93
6	1 2 5.94	6.30	+ 6 37 26.0	28.2	9.133	+56.50	+2 21.41	16 0.64	1 4.64	0 59 44.49
7	1 5 45.25	45.56	6 59 58.6	60.5	9.143	56.29	2 4.17	16 0.36	1 4.67	1 3 41.04
8	1 9 24.79	25.06	7 22 24.1	25.7	9.153	55.91	1 47.17	16 0.08	1 4.71	1 7 37.59
9	1 13 4.58	4.81	7 44 42.2	43.6	9.165	55.60	1 30.43	15 59.80	1 4.74	1 11 34.14
10	1 16 44.66	44.85	8 6 52.6	53.8	9.177	55.27	1 13.96	15 59.53	1 4.78	1 15 30.70
11	1 20 25.04	25.19	+ 8 28 55.0	55.9	9.189	+54.92	+0 57.79	15 59.25	1 4.82	1 19 27.25
12	1 24 5.74	5.85	8 50 49.1	49.7	9.202	54.57	0 41.94	15 58.98	1 4.87	1 23 23.81
13	1 27 46.76	46.83	9 12 34.4	34.8	9.216	54.20	0 26.41	15 58.70	1 4.91	1 27 20.36
14	1 31 28.13	28.16	9 34 10.6	10.8	9.231	53.82	+0 11.23	15 58.43	1 4.96	1 31 16.91
15	1 35 9.85	9.84	9 55 37.5	37.5	9.246	53.42	-0 3.60	15 58.15	1 5.01	1 35 13.46
16	1 38 51.95	51.90	+10 16 54.7	54.5	9.262	+53.01	-0 18.06	15 57.86	1 5.07	1 39 10.02
17	1 42 34.43	34.35	10 38 1.8	1.4	9.278	52.56	0 32.13	15 57.61	1 5.12	1 43 6.57
18	1 46 17.31	17.19	10 58 58.4	57.8	9.295	52.15	0 45.81	15 57.35	1 5.18	1 47 3.13
19	1 50 0.59	0.43	11 19 44.3	43.6	9.313	51.68	0 59.08	15 57.09	1 5.24	1 50 59.68
20	1 53 44.29	44.09	11 40 19.1	18.2	9.330	51.21	1 11.93	15 56.83	1 5.30	1 54 56.24
21	1 57 28.41	28.19	+12 0 42.3	41.2	9.348	+50.79	-1 24.36	15 56.58	1 5.36	1 58 52.79
22	2 1 12.97	12.72	12 20 53.6	52.3	9.366	50.28	1 36.36	15 56.33	1 5.43	2 2 49.35
23	2 4 57.97	57.69	12 40 52.8	51.3	9.385	49.71	1 47.92	15 56.08	1 5.50	2 6 45.90
24	2 8 43.42	43.11	13 0 39.4	37.8	9.405	49.17	1 59.02	15 55.83	1 5.57	2 10 42.46
25	2 12 29.34	29.00	13 20 13.1	11.4	9.423	48.63	2 9.65	15 55.58	1 5.64	2 14 39.01
26	2 16 15.73	15.37	+13 39 33.5	31.6	9.443	+48.07	-2 19.80	15 55.34	1 5.71	2 18 35.56
27	2 20 2.61	2.22	13 58 40.4	38.4	9.463	47.50	2 29.48	15 55.10	1 5.78	2 22 32.11
28	2 23 49.97	49.56	14 17 33.4	31.4	9.483	46.91	2 38.68	15 54.86	1 5.86	2 26 28.67
29	2 27 37.83	37.39	14 36 12.2	10.2	9.504	46.32	2 47.38	15 54.62	1 5.94	2 30 25.22
30	2 31 26.20	25.74	14 54 36.6	34.4	9.526	45.71	2 55.66	15 54.39	1 6.02	2 34 21.78
May 1	2 35 15.09	14.61	+15 12 46.1	43.9	9.546	+45.06	-3 3.22	15 54.16	1 6.10	2 38 18.33
2	2 39 4.51	4.01	15 30 40.5	38.2	9.571	44.44	3 10.35	15 53.93	1 6.18	2 42 14.89
3	2 43 54.48	53.96	15 48 19.4	17.1	9.594	43.80	3 16.94	15 53.70	1 6.26	2 46 11.44
4	2 48 45.00	44.46	16 5 42.6	40.3	9.617	43.14	3 22.98	15 53.47	1 6.34	2 50 8.00
5	2 53 36.08	35.52	16 22 49.9	47.5	9.640	42.46	3 28.46	15 53.24	1 6.42	2 54 4.55
6	2 58 27.73	27.15	+16 39 40.9	38.4	9.664	+41.78	-3 33.37	15 53.02	1 6.50	2 58 1.11
7	2 58 19.95	19.36	16 56 15.3	12.8	9.688	41.06	3 37.71	15 52.79	1 6.58	3 1 57.67
8	3 2 12.75	12.15	17 12 33.0	30.4	9.712	40.38	3 41.47	15 52.57	1 6.66	3 5 54.23
9	3 6 6.14	5.53	17 28 33.5	30.9	9.736	39.66	3 44.63	15 52.35	1 6.74	3 9 50.78
10	3 9 60.12	59.50	17 44 16.5	14.0	9.761	38.92	3 47.90	15 52.13	1 6.82	3 13 47.34
11	3 13 54.69	54.07	+17 59 41.9	39.4	9.786	+38.18	-3 49.19	15 51.92	1 6.90	3 17 43.89
12	3 17 49.86	49.23	18 14 49.4	46.9	9.811	37.43	3 50.68	15 51.71	1 6.99	3 21 40.45
13	3 21 45.62	44.99	18 29 38.5	36.1	9.836	36.66	3 51.38	15 51.50	1 7.07	3 25 37.00
14	3 25 41.98	41.34	18 44 9.0	6.7	9.860	35.88	3 51.68	15 51.29	1 7.15	3 29 33.56
15	3 29 38.92	38.28	18 58 20.8	18.5	9.885	35.09	3 51.19	15 51.09	1 7.23	3 33 30.11
16	3 33 36.44	35.80	+19 12 13.4	11.2	9.909	+34.28	-3 50.23	15 50.89	1 7.31	3 37 26.67
17	3 37 34.53	33.90	+19 25 46.6	44.5	9.933	+33.46	-3 48.69	15 50.70	1 7.39	3 41 23.23

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
May 17	3 37 34.53	33.90	+19 25 46.6	44.5	9.933	+33.46	-3 48.69	15 50.70	1 7.39	3 41 23.23
18	3 41 33.19	32.56	19 38 60.0	57.9	9.956	32.64	3 46.59	15 50.51	1 7.47	3 45 19.79
19	3 45 32.41	31.78	19 51 53.4	51.4	9.979	31.81	3 43.93	15 50.32	1 7.55	3 49 16.34
20	3 49 32.17	31.55	20 4 26.5	24.6	10.001	30.95	3 40.73	15 50.14	1 7.63	3 53 12.90
21	3 53 32.46	31.85	20 16 39.1	37.2	10.023	30.08	3 37.00	15 49.96	1 7.71	3 57 9.45
22	3 57 33.28	32.68	+20 28 30.8	29.0	10.044	+29.21	-3 32.74	15 49.79	1 7.78	4 1 6.01
23	4 1 34.61	34.02	20 39 61.5	59.8	10.065	28.33	3 27.96	15 49.63	1 7.85	4 5 2.57
24	4 5 36.44	35.87	20 51 10.8	9.2	10.086	27.44	3 22.69	15 49.47	1 7.92	4 8 59.13
25	4 9 38.76	38.20	21 1 58.6	57.1	10.106	26.54	3 16.93	15 49.31	1 7.99	4 12 55.68
26	4 13 41.55	41.01	21 12 24.6	23.2	10.126	25.62	3 10.70	15 49.15	1 8.06	4 16 52.24
27	4 17 44.80	44.28	+21 22 28.6	27.3	10.145	+24.70	-3 4.00	15 49.00	1 8.13	4 20 48.79
28	4 21 48.51	48.01	21 32 10.4	9.2	10.164	23.77	2 56.85	15 48.86	1 8.19	4 24 45.35
29	4 25 52.65	52.17	21 41 29.8	28.7	10.182	22.83	2 49.26	15 48.72	1 8.26	4 28 41.91
30	4 29 57.22	56.76	21 50 26.6	25.6	10.199	21.89	2 41.25	15 48.58	1 8.32	4 32 38.47
31	4 34 2.20	1.76	21 58 60.6	59.7	10.216	20.94	2 32.83	15 48.44	1 8.38	4 36 35.03
June 1	4 38 7.69	7.17	+22 7 11.6	10.8	10.232	+19.98	-2 24.01	15 48.31	1 8.44	4 40 31.59
2	4 42 13.37	12.98	22 14 59.5	58.8	10.248	19.01	2 14.79	15 48.18	1 8.49	4 44 28.14
3	4 46 19.52	19.16	22 22 24.2	23.6	10.264	18.04	2 5.19	15 48.05	1 8.54	4 48 24.70
4	4 50 26.04	25.71	22 29 25.4	24.9	10.279	17.06	1 55.23	15 47.92	1 8.59	4 52 21.25
5	4 54 32.90	32.60	22 36 3.1	2.6	10.293	16.08	1 44.92	15 47.80	1 8.64	4 56 17.81
6	4 58 40.10	39.83	+22 42 17.1	16.7	10.307	+15.09	-1 34.27	15 47.68	1 8.68	5 0 14.37
7	5 2 47.63	47.39	22 48 7.3	7.0	10.320	14.10	1 23.31	15 47.57	1 8.72	5 4 10.93
8	5 6 55.45	55.24	22 53 33.6	33.4	10.333	13.10	1 12.05	15 47.46	1 8.76	5 8 7.49
9	5 11 3.55	3.38	22 58 35.9	35.7	10.343	12.10	1 0.50	15 47.35	1 8.80	5 12 4.05
10	5 15 11.92	11.78	23 3 14.0	13.8	10.354	11.09	0 48.69	15 47.24	1 8.83	5 16 0.60
11	5 19 20.53	20.43	+23 7 27.7	27.6	10.364	+10.08	-0 36.64	15 47.14	1 8.86	5 19 57.16
12	5 23 29.36	29.29	23 11 17.1	17.1	10.373	9.06	0 24.37	15 47.04	1 8.88	5 23 53.72
13	5 27 38.38	38.35	23 14 42.1	42.1	10.380	8.04	-0 11.90	15 46.95	1 8.90	5 27 50.28
14	5 31 47.58	47.59	23 17 42.5	42.5	10.386	7.01	+0 0.74	15 46.86	1 8.92	5 31 46.83
15	5 35 56.92	56.96	23 20 18.3	18.3	10.392	5.98	0 13.52	15 46.78	1 8.94	5 35 43.39
16	5 40 6.37	6.45	+23 22 29.4	29.4	10.396	+4.95	+0 26.41	15 46.71	1 8.95	5 39 39.95
17	5 44 15.91	16.03	23 24 15.8	15.8	10.398	3.92	0 39.40	15 46.64	1 8.96	5 43 36.51
18	5 48 25.52	25.67	23 25 37.4	37.4	10.400	2.88	0 52.45	15 46.57	1 8.97	5 47 33.07
19	5 52 35.16	35.35	23 26 34.1	34.1	10.402	1.85	1 5.54	15 46.51	1 8.97	5 51 29.63
20	5 56 44.81	45.04	23 27 6.0	6.0	10.402	+0.82	1 18.63	15 46.46	1 8.97	5 55 26.18
21	6 0 54.44	54.71	+23 27 13.1	13.1	10.400	-0.22	+1 31.70	15 46.41	1 8.97	5 59 22.74
22	6 5 4.02	4.33	23 28 55.4	55.3	10.397	1.25	1 44.73	15 46.37	1 8.97	6 3 19.30
23	6 9 13.54	13.88	23 28 12.8	12.7	10.394	2.29	1 57.69	15 46.33	1 8.96	6 7 15.86
24	6 13 22.95	23.33	23 25 5.4	5.3	10.389	3.32	2 10.55	15 46.30	1 8.95	6 11 12.41
25	6 17 32.23	32.65	23 23 33.3	33.1	10.384	4.35	2 23.28	15 46.27	1 8.94	6 15 8.97
26	6 21 41.37	41.83	+23 21 36.5	36.2	10.377	-5.38	+2 35.87	15 46.25	1 8.93	6 19 5.53
27	6 25 50.35	50.84	23 19 15.0	14.7	10.369	6.40	2 48.28	15 46.23	1 8.90	6 23 2.09
28	6 29 59.14	59.66	23 16 29.0	28.7	10.361	7.48	3 0.51	15 46.21	1 8.87	6 26 58.65
29	6 34 7.71	8.27	23 13 18.5	18.1	10.352	8.44	3 12.53	15 46.20	1 8.84	6 30 55.21
30	6 38 16.05	16.65	23 9 43.6	43.1	10.349	9.45	3 24.32	15 46.19	1 8.81	6 34 51.76
31	6 42 24.15	24.78	+23 5 44.4	43.8	10.332	-10.46	+3 35.87	15 46.18	1 8.77	6 38 48.32
32	6 46 31.99	32.65	+23 1 21.0	20.3	10.320	-11.47	+3 47.14	15 46.18	1 8.73	6 42 44.88

Note.—For mean time interval of semidiameter passing meridian, subtract 0°.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
July 1	6 42 24.15	24.78	+23 5 44.4	43.8	10.332	-10.46	+3 35.87	15 46.18	1 8.77	6 39 48.32
2	6 46 31.99	32.65	23 1 21.0	20.3	10.330	11.47	3 47.14	15 46.18	1 8.73	6 42 44.88
3	6 50 39.55	40.24	22 56 33.5	32.7	10.308	12.47	3 58.14	15 46.18	1 8.69	6 46 41.44
4	6 54 46.80	47.52	22 51 22.1	21.2	10.285	13.47	4 8.84	15 46.18	1 8.65	6 50 37.90
5	6 58 53.75	54.50	22 45 46.9	45.8	10.262	14.46	4 19.22	15 46.19	1 8.60	6 54 34.55
6	7 3 0.37	1.14	+22 39 47.9	46.8	10.268	-15.44	+4 29.28	15 46.20	1 8.55	6 58 31.11
7	7 7 6.64	7.43	22 33 25.4	24.2	10.254	16.42	4 39.00	15 46.21	1 8.50	7 2 27.67
8	7 11 12.55	13.37	22 26 39.5	38.2	10.239	17.40	4 48.35	15 46.23	1 8.45	7 6 24.23
9	7 15 18.08	18.92	22 19 30.3	28.9	10.222	18.37	4 57.32	15 46.25	1 8.39	7 10 20.79
10	7 19 23.21	24.07	22 11 58.0	56.4	10.205	19.32	5 5.90	15 46.28	1 8.33	7 14 17.34
11	7 23 27.93	28.81	+22 4 2.7	1.0	10.188	-20.27	+5 14.07	15 46.31	1 8.27	7 18 13.90
12	7 27 32.23	33.13	21 55 44.7	42.8	10.170	21.22	5 21.80	15 46.35	1 8.21	7 22 10.46
13	7 31 36.08	37.00	21 47 4.1	2.1	10.151	22.16	5 29.09	15 46.39	1 8.14	7 26 7.02
14	7 35 39.47	40.41	21 37 61.1	59.0	10.131	23.09	5 35.92	15 46.43	1 8.07	7 30 3.57
15	7 39 42.37	43.33	21 28 36.0	33.7	10.111	24.00	5 42.27	15 46.48	1 8.00	7 34 0.13
16	7 43 44.77	45.74	+21 18 48.8	46.3	10.089	-24.91	+5 48.12	15 46.54	1 7.93	7 37 56.68
17	7 47 46.66	47.64	21 8 39.9	37.3	10.067	25.82	5 53.44	15 46.60	1 7.86	7 41 53.24
18	7 51 48.02	49.01	20 58 9.5	6.8	10.045	26.71	5 58.24	15 46.67	1 7.78	7 45 49.79
19	7 55 48.83	49.83	20 47 17.9	15.1	10.022	27.59	6 2.49	15 46.75	1 7.70	7 49 46.35
20	7 59 49.09	50.10	20 36 5.1	2.2	9.999	28.46	6 6.19	15 46.83	1 7.62	7 53 42.91
21	8 3 48.78	49.80	+20 24 31.5	28.5	9.975	-29.32	+6 9.32	15 46.91	1 7.54	7 57 39.47
22	8 7 47.88	48.91	20 12 37.4	34.3	9.951	30.17	6 11.86	15 47.00	1 7.46	8 1 36.03
23	8 11 46.39	47.42	20 0 23.0	19.8	9.926	31.02	6 13.81	15 47.09	1 7.38	8 5 32.59
24	8 15 44.30	45.33	19 47 48.7	45.4	9.901	31.85	6 15.16	15 47.19	1 7.30	8 9 29.14
25	8 19 41.60	42.63	19 34 54.6	51.2	9.876	32.68	6 15.91	15 47.29	1 7.31	8 13 25.70
26	8 23 38.20	39.32	+19 21 41.0	37.5	9.851	-33.46	+6 16.04	15 47.40	1 7.13	8 17 22.25
27	8 27 34.37	35.40	19 8 8.2	4.6	9.825	34.26	6 15.55	15 47.51	1 7.04	8 21 18.81
28	8 31 29.83	30.86	18 54 16.5	12.8	9.800	35.04	6 14.46	15 47.62	1 6.96	8 25 15.37
29	8 35 24.68	25.70	18 40 6.3	2.5	9.774	35.81	6 12.76	15 47.74	1 6.87	8 29 11.93
30	8 39 18.92	19.93	18 25 37.7	33.9	9.749	36.57	6 10.44	15 47.86	1 6.79	8 33 8.48
31	8 43 12.55	13.55	+18 10 50.9	47.1	9.723	-37.32	+6 7.51	15 47.98	1 6.70	8 37 5.04
Aug. 1	8 47 5.58	6.57	17 55 46.3	42.4	9.697	38.06	6 3.98	15 48.11	1 6.62	8 41 1.59
2	8 50 58.01	58.99	17 40 24.2	20.3	9.672	38.78	5 59.85	15 48.24	1 6.53	8 44 58.15
3	8 54 49.84	50.80	17 24 44.8	40.9	9.647	39.49	5 55.12	15 48.37	1 6.44	8 48 54.70
4	8 58 41.08	42.02	17 8 48.4	44.5	9.623	40.20	5 49.80	15 48.50	1 6.35	8 52 51.26
5	9 2 31.73	32.65	+16 52 35.4	31.5	9.599	-40.89	+5 43.90	15 48.63	1 6.27	8 56 47.81
6	9 6 21.81	22.71	16 36 6.0	2.1	9.575	41.56	5 37.42	15 48.77	1 6.18	9 0 44.37
7	9 10 11.31	12.19	16 19 20.4	16.5	9.551	42.23	5 30.36	15 48.91	1 6.10	9 4 40.93
8	9 14 0.24	1.10	16 2 18.9	15.1	9.527	42.88	5 22.73	15 49.06	1 6.01	9 8 37.49
9	9 17 48.61	49.45	15 44 61.9	58.1	9.504	43.52	5 14.54	15 49.21	1 5.93	9 12 34.04
10	9 21 36.42	37.24	+15 27 29.7	26.0	9.481	-44.15	+5 5.80	15 49.37	1 5.84	9 16 30.60
11	9 25 23.68	24.47	15 9 42.5	38.9	9.458	44.77	4 56.50	15 49.53	1 5.75	9 20 27.15
12	9 29 10.40	11.15	14 51 40.7	37.1	9.435	45.38	4 46.66	15 49.70	1 5.67	9 24 23.71
13	9 32 56.57	57.29	14 33 24.5	21.0	9.412	45.96	4 36.28	15 49.87	1 5.59	9 28 20.26
14	9 36 42.20	42.89	14 14 54.4	51.0	9.389	46.54	4 25.36	15 50.04	1 5.51	9 32 16.82
15	9 40 27.30	27.96	+13 56 10.6	7.3	9.366	-47.10	+4 13.90	15 50.21	1 5.43	9 36 13.37
16	9 44 11.87	12.50	+13 37 13.4	10.2	9.343	-47.66	+4 1.92	15 50.39	1 5.36	9 40 9.93

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
Aug. 16	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
16	9 44 11.87	12.50	+13 37 13.4	10.2	9.346	-47.66	+ 4 1.92	15 50.39	1 5.36	9 40 9.93
17	9 47 55.92	56 52	13 18 3.2	0.1	9.395	48.19	3 49.41	15 50.58	1 5.28	9 44 6.48
18	9 51 39.46	40.02	12 58 40.3	37.4	9.304	48.71	3 36.39	15 50.77	1 5.22	9 49 3.04
19	9 55 22.49	23.01	12 39 5.1	2.3	9.283	49.21	3 22.87	15 50.97	1 5.15	9 51 59.59
20	9 59 5.02	5.51	12 19 17.9	15.3	9.262	49.70	3 8.86	15 51.17	1 5.08	9 55 56.14
21	10 2 47.07	47.52	+11 59 19.1	16.6	9.242	-50.18	+ 2 54.36	15 51.37	1 5.01	9 59 52.69
22	10 6 28.64	29.05	11 39 8.9	6.6	9.223	50.65	2 39.37	15 51.58	1 4.95	10 3 49.25
23	10 10 9.75	10.12	11 18 47.7	45.6	9.204	51.10	2 23.92	15 51.79	1 4.88	10 7 45.80
24	10 13 50.42	50.75	10 58 15.8	13.9	9.185	51.54	2 8.04	15 52.00	1 4.82	10 11 42.36
25	10 17 30.66	30.95	10 37 33.6	31.9	9.167	51.97	1 51.72	15 52.22	1 4.76	10 15 38.91
26	10 21 10.47	10.72	+10 16 41.4	39.9	9.151	-52.38	+ 1 34.98	15 52.44	1 4.70	10 19 35.47
27	10 24 49.89	50.09	9 55 39.4	38.2	9.135	52.77	1 17.85	15 52.66	1 4.64	10 23 32.02
28	10 28 28.92	29.08	9 34 28.0	27.0	9.119	53.16	1 0.33	15 52.88	1 4.59	10 27 28.58
29	10 32 7.60	7.71	9 13 7.5	6.7	9.104	53.54	0 42.46	15 53.10	1 4.54	10 31 25.13
30	10 35 45.93	45.99	8 51 38.2	37.7	9.090	53.90	0 24.25	15 53.33	1 4.49	10 35 21.68
31	10 39 23.94	23.95	+ 8 30 0.5	0.3	9.077	-54.24	+ 0 5.71	15 53.55	1 4.44	10 39 18.23
Sept. 1	10 43 1.64	1.61	8 8 14.6	14.7	9.066	54.58	- 0 13.14	15 53.78	1 4.39	10 43 14.79
2	10 46 39.07	38.99	7 46 20.7	21.2	9.055	54.91	0 32.27	15 54.01	1 4.35	10 47 11.34
3	10 50 16.24	16.11	7 24 19.3	20.1	9.044	55.22	0 51.65	15 54.24	1 4.31	10 51 7.90
4	10 53 53.17	52.99	7 2 10.6	11.7	9.034	55.51	1 11.28	15 54.47	1 4.27	10 55 4.45
5	10 57 29.87	29.64	+ 6 39 54.9	56.3	9.025	-55.80	- 1 31.12	15 54.71	1 4.24	10 59 1.01
6	11 1 6.37	6.09	6 17 32.5	34.2	9.017	56.07	1 51.16	15 54.94	1 4.21	11 2 57.56
7	11 4 42.69	42.36	5 55 3.8	5.8	9.010	56.33	2 11.38	15 55.18	1 4.18	11 6 54.11
8	11 8 18.85	18.47	5 32 29.1	31.4	9.003	56.58	2 31.78	15 55.42	1 4.16	11 10 50.66
9	11 11 54.86	54.43	5 9 48.6	51.3	8.997	56.80	2 52.32	15 55.66	1 4.14	11 14 47.22
10	11 15 30.73	30.25	+ 4 47 2.7	5.8	8.992	-57.01	- 3 12.99	15 55.91	1 4.12	11 18 43.77
11	11 19 6.49	5.96	4 24 11.9	15.3	8.987	57.21	3 33.79	15 56.16	1 4.10	11 22 40.33
12	11 22 42.15	41.57	4 1 16.3	20.1	8.983	57.40	3 54.68	15 56.41	1 4.08	11 26 36.88
13	11 26 17.72	17.09	3 38 16.4	20.5	8.981	57.58	4 15.65	15 56.67	1 4.07	11 30 33.43
14	11 29 53.23	52.54	3 15 12.5	16.9	8.979	57.74	4 36.68	15 56.93	1 4.06	11 34 29.96
15	11 33 28.69	27.95	+ 2 52 4.8	9.6	8.977	-57.89	- 4 57.77	15 57.19	1 4.05	11 38 26.54
16	11 37 4.12	3.33	2 28 53.9	59.0	8.976	58.01	5 18.89	15 57.45	1 4.05	11 42 23.09
17	11 40 39.53	38.68	2 5 40.1	45.6	8.975	58.19	5 40.04	15 57.72	1 4.05	11 46 19.65
18	11 44 14.94	14.04	1 42 23.8	29.6	8.976	58.22	6 1.18	15 57.99	1 4.05	11 50 16.30
19	11 47 50.37	49.42	1 19 5.2	11.4	8.977	58.30	6 22.29	15 58.26	1 4.06	11 54 12.75
20	11 51 25.83	24.83	+ 0 55 44.8	51.4	8.979	-58.37	- 6 43.37	15 58.53	1 4.07	11 58 9.30
21	11 55 1.35	0.99	0 32 23.0	29.9	8.982	58.43	7 4.40	15 58.80	1 4.08	12 2 5.85
22	11 58 36.94	35.83	+ 0 9 0.0	7.3	8.985	58.48	7 25.36	15 59.07	1 4.10	12 6 2.40
23	12 2 12.63	11.47	- 0 14 23.7	16.1	8.990	58.50	7 46.22	15 59.35	1 4.12	12 9 58.96
24	12 5 48.45	47.23	0 37 48.0	40.0	8.995	58.52	8 6.96	15 59.62	1 4.14	12 13 55.51
25	12 9 24.40	23.13	- 1 1 12.4	4.1	9.001	-58.52	- 8 27.55	15 59.90	1 4.16	12 17 52.07
26	12 12 60.51	59.19	1 24 36.5	27.9	9.009	58.50	8 47.98	16 0.17	1 4.19	12 21 48.62
27	12 16 36.81	35.44	1 47 60.2	51.2	9.017	58.47	9 8.23	16 0.45	1 4.22	12 25 45.17
28	12 20 13.33	11.90	2 11 23.0	13.7	9.026	58.43	9 28.27	16 0.72	1 4.25	12 29 41.72
29	12 23 50.08	48.60	2 34 44.6	35.0	9.037	58.37	9 48.07	16 1.00	1 4.29	12 33 38.28
30	12 27 27.09	25.56	- 2 57 64.6	54.7	9.049	-58.29	-10 7.62	16 1.27	1 4.33	12 37 34.83
31	12 31 4.38	2.80	- 3 21 22.8	12.6	9.061	-58.21	-10 26.69	16 1.55	1 4.37	12 41 31.39

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Oct. 1	12 31 4.38	2.80	- 3 21 22.8	12.6	9.061	-56.91	-10 26.88	16 1.55	1 4.37	12 41 31.39
2	12 34 41.99	40.35	3 44 39.9	28.4	9.074	58.11	10 45.82	16 1.82	1 4.42	12 45 27.94
3	12 38 19.92	18.24	4 7 52.5	41.7	9.088	58.00	11 4.43	16 2.10	1 4.47	12 49 24.49
4	12 41 58.21	56.48	4 30 63.2	52.1	9.103	57.88	11 22.69	16 2.37	1 4.52	12 53 21.04
5	12 45 36.87	35.09	4 53 70.8	59.5	9.120	57.74	11 40.58	16 2.65	1 4.57	12 57 17.60
6	12 49 15.93	14.10	- 5 17 14.8	3.4	9.137	-57.58	-11 58.08	16 2.92	1 4.63	13 1 14.15
7	12 52 55.40	53.53	5 40 14.9	3.2	9.154	57.41	12 15.16	16 3.19	1 4.69	13 5 10.71
8	12 56 35.31	33.39	6 2 70.8	58.9	9.173	57.23	12 31.80	16 3.46	1 4.75	13 9 7.26
9	13 0 15.67	13.71	6 25 62.0	49.9	9.192	57.04	12 47.97	16 3.74	1 4.82	13 13 3.81
10	13 3 56.50	54.50	6 49 48.2	35.9	9.212	56.83	13 3.71	16 4.01	1 4.89	13 17 0.36
11	13 7 37.82	35.77	- 7 11 29.0	16.5	9.232	-56.59	-13 18.96	16 4.28	1 4.96	13 20 56.92
12	13 11 19.64	17.54	7 33 64.0	51.3	9.253	56.33	13 33.69	16 4.55	1 5.03	13 24 53.47
13	13 14 61.98	59.83	7 56 32.9	20.0	9.275	56.07	13 47.91	16 4.83	1 5.11	13 28 50.03
14	13 18 44.84	42.66	8 18 55.2	42.2	9.297	55.79	14 1.60	16 5.10	1 5.19	13 32 46.58
15	13 22 28.25	26.03	8 40 70.4	57.3	9.320	55.49	14 14.75	16 5.39	1 5.27	13 36 43.13
16	13 26 12.23	9.97	- 9 3 18.2	4.9	9.344	-55.16	-14 27.33	16 5.65	1 5.35	13 40 39.68
17	13 29 56.78	54.48	9 25 18.2	4.8	9.368	54.89	14 39.33	16 5.93	1 5.44	13 44 36.24
18	13 33 41.91	39.58	9 46 69.9	56.4	9.394	54.47	14 50.75	16 6.20	1 5.53	13 48 32.79
19	13 37 27.65	25.28	10 8 53.0	39.4	9.420	54.10	15 1.57	16 6.48	1 5.62	13 52 29.35
20	13 41 14.02	11.61	10 30 27.0	13.3	9.446	53.72	15 11.77	16 6.75	1 5.72	13 56 25.90
21	13 44 61.02	58.58	-10 51 51.5	27.8	9.472	-53.39	-15 21.34	16 7.03	1 5.82	14 0 22.46
22	13 48 48.66	46.19	11 12 66.2	52.5	9.499	52.90	15 20.25	16 7.30	1 5.92	14 4 19.01
23	13 52 36.96	34.46	11 33 70.7	57.0	9.527	52.46	15 38.50	16 7.58	1 6.02	14 8 15.56
24	13 56 25.95	23.43	11 54 64.5	50.8	9.556	52.01	15 46.08	16 7.85	1 6.12	14 12 12.11
25	14 0 15.64	13.10	12 15 47.3	33.6	9.585	51.55	15 52.96	16 8.12	1 6.23	14 16 8.67
26	14 4 6.04	3.48	-12 36 18.8	5.1	9.616	-51.08	-15 59.12	16 8.38	1 6.33	14 20 5.23
27	14 7 57.18	54.59	12 56 38.4	24.8	9.647	50.56	16 4.55	16 8.64	1 6.44	14 24 1.78
28	14 11 49.06	46.45	13 16 45.9	32.4	9.678	50.05	16 9.23	16 8.90	1 6.55	14 27 58.33
29	14 15 41.70	39.07	13 36 40.8	27.4	9.710	49.52	16 13.15	16 9.15	1 6.66	14 31 54.89
30	14 19 35.12	32.47	13 56 22.8	9.5	9.743	48.97	16 16.29	16 9.40	1 6.77	14 35 51.44
31	14 23 29.33	26.67	-14 15 51.6	38.4	9.776	-48.41	-16 18.65	16 9.64	1 6.88	14 39 48.00
Nov. 1	14 27 24.35	21.68	14 34 66.6	53.6	9.810	47.83	16 20.20	16 9.88	1 6.99	14 43 44.55
2	14 31 20.18	17.50	14 53 67.6	54.7	9.844	47.24	16 20.93	16 10.12	1 7.11	14 47 41.11
3	14 35 16.84	14.15	15 12 54.1	41.3	9.878	46.63	16 20.83	16 10.36	1 7.22	14 51 37.66
4	14 39 14.34	11.64	15 31 25.8	13.2	9.913	46.00	16 19.90	16 10.60	1 7.34	14 55 34.22
5	14 43 12.68	9.97	-15 49 42.3	29.9	9.948	-45.36	-16 18.13	16 10.84	1 7.46	14 59 30.77
6	14 47 11.87	9.16	16 7 43.1	30.9	9.984	44.80	16 15.50	16 11.07	1 7.58	15 3 27.33
7	14 51 11.92	9.21	16 25 27.7	15.7	10.020	44.01	16 12.01	16 11.30	1 7.70	15 7 23.89
8	14 55 12.83	10.12	16 42 55.8	44.1	10.056	43.30	16 7.67	16 11.53	1 7.82	15 11 20.44
9	14 59 14.60	11.89	16 59 67.1	55.6	10.092	42.61	16 2.46	16 11.76	1 7.94	15 15 16.99
10	15 3 17.22	14.52	-17 16 61.1	49.9	10.128	-41.87	-15 56.40	16 11.98	1 8.06	15 19 13.55
11	15 7 20.70	18.01	17 33 37.3	26.4	10.164	41.19	15 49.49	16 12.21	1 8.18	15 23 10.11
12	15 11 25.03	22.35	17 49 55.2	44.6	10.199	40.35	15 41.73	16 12.43	1 8.30	15 27 6.67
13	15 15 30.21	27.55	18 5 54.5	44.2	10.234	39.57	15 33.11	16 12.64	1 8.42	15 31 3.22
14	15 19 36.24	33.60	18 21 34.8	24.8	10.268	38.77	15 23.65	16 12.85	1 8.54	15 34 59.78
15	15 23 43.10	40.48	-18 36 55.7	46.0	10.303	-37.85	-15 13.35	16 13.07	1 8.65	15 38 56.33
16	15 27 50.79	48.20	18 51 56.8	47.4	10.337	-37.18	-15 2.22	16 13.28	1 8.76	15 42 52.89

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Nov. 16	15 27 50.79	48.20	-18 51 56.8	47.4	10.337	-37.19	-15 2.22	16 13.28	1 8.76	15 42 52.29
17	15 31 59.30	56.74	19 6 37.6	28.6	10.371	36.87	14 50.27	16 13.49	1 8.89	15 46 49.44
18	15 36 8.62	6.09	19 20 57.8	49.2	10.405	35.40	14 37.51	16 13.70	1 8.99	15 50 46.00
19	15 40 18.75	16.25	19 34 56.9	48.7	10.439	34.52	14 23.95	16 13.91	1 9.11	15 54 42.56
20	15 44 29.68	27.21	19 48 34.7	26.8	10.473	33.63	14 9.58	16 14.11	1 9.22	15 58 39.12
21	15 48 41.40	38.97	-20 1 50.7	43.1	10.505	-32.70	-13 54.42	16 14.31	1 9.33	16 2 35.67
22	15 52 53.90	51.51	20 14 44.7	37.4	10.537	31.78	13 38.50	16 14.50	1 9.44	16 6 32.23
23	15 57 7.16	4.81	20 27 16.2	9.3	10.569	30.84	13 21.80	16 14.69	1 9.55	16 10 28.79
24	16 1 21.18	18.88	20 39 24.9	18.4	10.601	29.88	13 4.33	16 14.88	1 9.66	16 14 25.35
25	16 5 35.96	33.70	20 51 10.6	4.4	10.631	28.92	12 46.11	16 15.06	1 9.76	16 18 21.90
26	16 9 51.48	49.27	-21 2 32.8	27.0	10.661	-27.94	-12 27.14	16 15.24	1 9.86	16 22 18.46
27	16 14 7.72	5.56	21 13 31.3	25.9	10.691	26.95	12 7.45	16 15.40	1 9.96	16 26 15.01
28	16 18 24.68	22.57	21 24 5.9	0.8	10.721	25.94	11 47.06	16 15.56	1 10.06	16 30 11.57
29	16 22 42.34	40.29	21 34 16.1	11.3	10.750	24.91	11 25.97	16 15.72	1 10.16	16 34 8.13
30	16 26 60.68	58.69	21 43 61.7	57.3	10.778	23.88	11 4.18	16 15.87	1 10.25	16 38 4.69
Dec. 1	16 31 19.70	17.77	-21 53 22.5	18.4	10.806	-22.84	-10 41.72	16 16.02	1 10.34	16 42 1.25
2	16 35 39.37	37.50	22 2 18.2	14.4	10.833	21.79	10 18.61	16 16.16	1 10.42	16 45 57.81
3	16 39 59.66	57.86	22 10 48.4	45.0	10.858	20.73	9 54.87	16 16.30	1 10.50	16 49 54.36
4	16 44 20.57	18.84	22 18 52.9	49.8	10.883	19.65	9 30.52	16 16.43	1 10.58	16 53 50.92
5	16 48 42.06	40.40	22 26 31.4	28.6	10.907	18.56	9 5.59	16 16.56	1 10.65	16 57 47.47
6	16 53 4.11	2.53	-22 33 43.7	41.2	10.929	-17.47	-8 40.08	16 16.69	1 10.72	17 1 44.03
7	16 57 26.69	25.19	22 40 29.7	27.4	10.950	16.36	8 14.05	16 16.81	1 10.79	17 5 40.59
8	17 1 49.78	48.36	22 46 49.0	47.0	10.971	15.24	7 47.52	16 16.92	1 10.85	17 9 37.15
9	17 6 13.34	12.00	22 52 41.5	39.7	10.990	14.12	7 20.52	16 17.03	1 10.91	17 13 33.71
10	17 10 37.32	36.06	22 58 6.9	5.3	11.007	12.99	6 53.09	16 17.14	1 10.97	17 17 30.27
11	17 15 1.70	0.53	-23 3 4.9	3.5	11.023	-11.85	-6 25.25	16 17.25	1 11.02	17 21 26.83
12	17 19 26.46	25.37	23 7 35.5	34.3	11.038	10.70	5 57.04	16 17.35	1 11.07	17 25 23.39
13	17 23 51.55	50.54	23 11 38.5	37.5	11.051	9.55	5 28.50	16 17.45	1 11.12	17 29 19.94
14	17 28 16.94	16.02	23 15 13.7	12.9	11.063	8.40	4 59.66	16 17.55	1 11.16	17 33 16.50
15	17 32 42.59	41.76	23 18 21.0	20.4	11.073	7.23	4 30.57	16 17.64	1 11.19	17 37 13.06
16	17 37 8.46	7.72	-23 21 0.4	0.0	11.081	-6.06	-4 1.25	16 17.73	1 11.22	17 41 9.62
17	17 41 34.52	33.86	23 23 11.7	11.4	11.088	4.89	3 31.74	16 17.82	1 11.24	17 45 6.18
18	17 46 0.72	0.16	23 24 54.8	54.6	11.095	3.71	3 2.07	16 17.90	1 11.26	17 49 2.74
19	17 50 27.04	26.58	23 26 9.6	9.5	11.099	2.53	2 32.29	16 17.97	1 11.28	17 52 59.29
20	17 54 53.45	53.08	23 26 56.2	56.1	11.101	1.35	2 2.43	16 18.04	1 11.29	17 56 55.85
21	17 59 19.92	19.63	-23 27 14.6	14.5	11.102	-0.17	-1 32.52	16 18.10	1 11.30	18 0 52.41
22	18 3 46.40	46.20	23 27 4.6	4.6	11.103	+1.00	1 2.60	16 18.16	1 11.30	18 4 48.97
23	18 8 12.85	12.74	23 26 26.3	26.3	11.102	2.18	0 32.70	16 18.21	1 11.30	18 8 45.53
24	18 12 39.26	39.24	23 25 19.8	19.8	11.099	3.36	-0 2.84	16 18.26	1 11.29	18 12 42.09
25	18 17 5.60	5.68	23 23 45.0	45.0	11.095	4.54	+0 26.96	16 18.30	1 11.28	18 16 36.64
26	18 21 31.84	32.01	-23 21 42.0	41.9	11.091	+5.71	+0 56.66	16 18.34	1 11.27	18 20 35.20
27	18 25 57.94	58.20	23 19 10.9	10.7	11.085	6.88	1 26.22	16 18.36	1 11.25	18 24 31.76
28	18 30 23.87	24.22	23 16 11.7	11.4	11.077	8.05	1 55.60	16 18.38	1 11.22	18 28 28.32
29	18 34 49.61	50.05	23 12 44.5	44.1	11.068	9.21	2 24.79	16 18.40	1 11.19	18 32 24.88
30	18 39 15.13	15.66	23 8 49.5	49.0	11.058	10.37	2 53.76	16 18.41	1 11.16	18 36 21.44
31	18 43 40.40	41.02	-23 4 26.8	26.2	11.046	+11.58	+3 22.48	16 18.41	1 11.12	18 40 17.99
32	18 48 5.38	6.09	-22 50 36.5	35.7	11.034	+12.67	+3 50.91	16 18.41	1 11.08	18 44 14.55

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semi- diameter. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
Jan. 1	h m	m	h m s	s	° ' "	"	s	' "	' "	I. S.
2	8 53.21	1.907	3 39 52.04	194.57	+16 18 39.0	+565.0	64.52	14 57.8	54 48.3	I. S.
3	9 39.66	1.964	4 30 23.27	198.08	19 39 41.8	436.1	65.39	14 52.1	54 26.4	I. S.
4	10 27.51	2.030	5 22 18.44	131.30	22 4 57.0	286.4	66.19	14 47.7	54 11.0	I. S.
5	11 16.47	2.051	6 15 20.68	133.46	23 26 49.0	+190.8	66.70	14 45.1	54 1.4	I. S.
6	12 5.90	2.058	7 8 51.57	133.66	23 40 41.2	-52.0	66.73	14 44.0	53 57.4	I. N.
7	12 55.01	2.098	8 2 2.52	131.84	+22 46 0.5	-290.0	66.27	14 44.3	53 58.5	II. N. S.
8	13 43.06	1.973	8 54 9.78	198.53	20 46 28.4	-374.4	65.43	14 46.1	54 5.5	II. S.
9	14 29.62	1.907	9 44 47.46	194.59	17 49 8.3	-508.2	64.46	14 49.8	54 18.5	II. S.
10	15 14.65	1.846	10 33 53.54	191.07	14 3 3.7	-618.0	63.59	14 55.2	54 38.4	II. S.
11	15 58.51	1.811	11 21 48.67	119.46	9 38 2.1	-703.1	63.03	15 2.4	55 5.1	II. S.
12	16 41.84	1.806	12 9 12.24	119.19	+ 4 43 59.6	-763.1	62.98	15 12.0	55 40.3	II. S.
13	17 25.53	1.843	12 56 57.59	190.71	- 0 28 49.6	-796.6	63.64	15 23.8	56 23.2	II. S.
14	18 10.65	1.896	13 46 8.78	195.94	5 49 3.6	-799.1	65.00	15 37.3	57 13.3	II. S.
15	18 58.37	2.000	14 37 56.55	133.79	11 2 46.2	-702.2	67.09	15 52.5	58 6.8	II. S.
16	19 49.86	2.238	15 33 30.76	144.53	15 51 49.5	-679.9	69.77	16 8.1	59 6.2	II. S.
17	20 45.98	2.440	16 33 43.43	156.46	-19 52 46.5	-519.7	72.70	16 22.9	60 0.6	II. S.
18	21 46.80	2.690	17 38 39.53	167.99	22 38 47.5	-296.4	75.20	16 35.2	60 45.9	II. S.
19	22 51.13	2.790	18 47 6.32	173.49	23 44 4.4	- 91.8	76.56	16 43.1	61 15.0	II. N.
20	23 56.45	2.700	19 56 33.02	179.29	22 54 44.2	+266.3	76.28	16 45.8	61 24.6	II. N.
21	0 59.90	2.572	21 4 7.06	164.59	20 15 24.3	519.3	74.47	16 42.2	61 11.4	I. N.
22	1 59.46	2.388	22 7 47.06	153.54	-16 7 52.9	+704.1	71.84	16 33.0	60 37.8	I. S.
23	2 54.51	2.304	23 6 55.49	142.47	11 2 4.9	811.9	69.13	16 19.1	59 48.6	I. S.
24	3 45.52	2.054	0 2 0.63	133.47	- 5 27 8.8	852.4	66.95	16 3.9	58 51.0	I. S.
25	4 33.50	1.952	0 54 3.84	127.33	+ 0 13 3.7	841.2	65.39	15 47.5	57 50.5	I. S.
26	5 19.61	1.896	1 44 15.00	124.08	5 40 32.4	790.9	64.56	15 31.7	56 52.6	I. S.
27	6 4.96	1.867	2 33 39.67	123.37	+10 41 47.2	+711.1	64.39	15 17.7	56 1.2	I. S.
28	6 50.44	1.908	3 23 12.64	124.06	15 6 6.4	806.8	64.76	15 6.0	55 18.1	I. S.
29	7 36.72	1.951	4 13 33.60	127.93	18 44 17.9	480.6	65.36	14 56.9	54 44.7	I. S.
30	8 24.14	2.000	5 5 3.28	130.90	21 28 3.2	334.9	66.09	14 50.4	54 20.9	I. S.
31	9 12.67	2.039	5 57 39.33	132.00	23 10 12.6	173.4	66.62	14 46.4	54 6.2	I. S.
Feb. 1	10 1.89	2.059	6 50 57.28	133.58	+23 45 37.0	+ 3.1	66.82	14 44.6	53 59.6	I. N.
2	10 51.14	2.044	7 44 16.67	132.69	23 12 15.9	-167.3	66.54	14 44.8	54 0.0	I. N.
3	11 39.68	1.994	8 36 54.05	130.90	21 32 1.5	-329.1	65.83	14 46.6	54 6.7	I. N.
4	12 27.00	1.935	9 28 15.72	126.56	18 50 30.8	-473.6	64.87	14 49.7	54 18.5	II. N.
5	13 12.77	1.879	10 18 7.73	122.79	15 16 14.9	-593.3	63.91	14 54.3	54 35.1	II. S.
6	13 57.21	1.832	11 6 38.09	119.88	+10 59 25.8	-686.0	63.16	15 0.0	54 56.1	II. S.
7	14 40.75	1.804	11 54 14.19	118.49	6 11 6.3	-751.1	62.68	15 7.0	55 21.7	II. S.
8	15 24.10	1.813	12 41 38.55	119.02	+ 1 2 24.5	-787.3	63.04	15 15.2	55 52.2	II. S.
9	16 8.14	1.860	13 29 45.03	121.67	- 4 14 35.5	-792.5	63.92	15 24.9	56 27.5	II. S.
10	16 53.87	1.958	14 19 35.09	127.67	9 26 52.6	-702.7	65.48	15 35.8	57 7.6	II. S.
11	17 42.47	2.096	15 12 13.29	136.00	-14 19 6.8	-690.6	67.67	15 47.8	57 51.9	II. S.
12	18 34.77	2.267	16 8 36.69	146.97	18 32 34.8	-567.3	70.28	16 0.6	58 37.6	II. S.
13	19 31.35	2.446	17 9 17.19	157.08	21 45 11.3	-385.3	72.88	16 13.1	59 24.6	II. S.
14	20 31.88	2.584	18 13 55.64	165.52	23 33 39.4	-147.9	74.87	16 24.3	60 5.7	II. N.
15	21 34.32	2.643	19 21 4.90	169.06	-23 39 11.5	+123.6	75.69	16 32.6	60 36.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Std. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 15	21 34.82	2.643	19 21 4.90	106.08	-23 39 14.5	+123.6	75.69	16 32.6	60 36.8	II. N.
16	22 38.15	2.606	20 28 25.59	106.49	21 55 9.9	392.2	74.97	16 37.2	60 53.3	II. N.
17	23 39.31	2.479	21 33 39.86	158.66	18 30 48.9	618.5	73.18	16 36.6	60 51.0	II. N.
19	0 36.93	2.323	22 35 24.67	149.42	13 48 57.4	777.3	70.86	16 31.0	60 29.9	I. N.
20	1 30.82	2.174	23 33 23.86	140.66	8 18 27.5	862.5	68.65	16 20.6	59 52.2	I. S.
21	2 21.51	2.059	0 28 10.32	134.10	- 2 27 25.0	+883.9	66.92	16 7.0	59 2.2	I. S.
22	3 9.93	1.984	1 20 39.80	129.23	+ 3 20 15.2	848.8	65.82	15 51.6	58 5.7	I. S.
23	3 57.07	1.950	2 11 52.60	127.23	8 46 8.1	773.3	65.36	15 36.0	57 8.5	I. S.
24	4 43.84	1.928	3 2 42.97	127.27	13 36 5.9	670.7	65.44	15 21.5	56 15.0	I. S.
25	5 30.93	1.974	3 53 52.85	128.74	17 39 17.0	541.9	65.84	15 8.7	55 28.8	I. S.
26	6 18.77	2.007	4 45 47.57	130.86	+20 47 3.2	+394.1	66.42	14 58.9	54 52.2	I. S.
27	7 7.45	2.040	5 38 32.74	132.78	22 52 36.0	221.3	66.89	14 51.6	54 25.2	I. S.
28	7 56.72	2.068	6 31 53.68	133.70	23 56 7.1	+ 58.5	67.10	14 47.6	54 10.5	I. N.
Mar. 1	8 46.07	2.049	7 25 19.80	133.16	23 40 24.5	-114.6	66.90	14 46.3	54 5.7	I. N.
2	9 34.92	2.013	8 18 14.50	131.15	22 21 25.9	-279.6	66.29	14 47.2	54 9.4	I. N.
3	10 22.71	1.961	9 10 6.33	128.06	+19 58 23.8	-422.2	65.40	14 50.4	54 21.0	I. N.
4	11 9.17	1.908	10 0 38.66	124.66	16 38 24.6	-563.8	64.44	14 55.3	54 39.0	I. N.
5	11 54.36	1.862	10 49 53.57	121.73	12 30 43.5	-670.1	63.64	15 1.5	55 1.7	I. N.
6	12 38.58	1.830	11 38 11.11	119.98	7 46 6.7	-748.0	63.17	15 8.6	55 27.6	II. N.
7	13 22.44	1.825	12 26 6.04	119.93	+ 2 36 25.8	-765.1	63.19	15 16.3	55 55.9	II. S.
8	14 6.67	1.862	13 14 24.02	121.96	- 2 45 27.1	-808.5	63.78	15 24.3	56 25.5	II. S.
9	14 52.17	1.935	14 3 58.00	126.29	8 5 25.0	-784.7	65.02	15 32.7	56 56.2	II. S.
10	15 39.86	2.044	14 55 43.60	132.91	13 7 40.8	-719.1	66.81	15 41.3	57 27.7	II. S.
11	16 30.57	2.186	15 50 31.31	141.36	17 34 23.3	-606.8	69.04	15 50.0	57 59.8	II. S.
12	17 24.85	2.340	16 48 53.34	150.49	21 5 38.2	-441.1	71.35	15 58.5	58 31.4	II. S.
13	18 22.61	2.468	17 50 44.93	158.39	-23 21 0.2	-227.4	73.29	16 6.9	59 2.0	II. S.
14	19 22.91	2.543	18 55 9.70	166.87	24 3 5.5	- 21.6	74.34	16 14.3	59 29.2	II. N.
15	20 24.06	2.536	20 0 24.84	162.44	23 2 34.9	+279.8	74.20	16 20.1	59 50.2	II. N.
16	21 24.12	2.456	21 4 34.79	157.69	20 22 10.8	515.3	72.99	16 23.3	60 1.9	II. N.
17	22 21.67	2.336	22 6 13.92	150.61	16 16 33.6	702.2	71.13	16 23.2	60 1.7	II. N.
18	23 16.16	2.208	23 4 49.08	142.84	-11 8 27.9	+826.6	69.20	16 19.5	59 48.0	II. N.
20	0 7.82	2.101	0 0 33.86	136.36	- 5 23 42.2	886.3	67.58	16 12.2	59 21.0	II. N.
21	0 57.35	2.032	0 54 10.05	131.97	+ 0 32 44.5	886.6	66.47	16 1.7	58 42.7	I. S.
22	1 45.60	1.994	1 46 29.67	129.83	6 18 50.0	836.2	65.96	15 49.1	57 56.7	I. S.
23	2 33.41	1.993	2 38 22.67	129.76	11 36 13.1	744.6	65.97	15 35.7	57 7.3	I. S.
24	3 21.44	2.014	3 30 29.03	131.06	+16 10 11.0	+820.4	66.36	15 22.5	56 19.0	I. S.
25	4 10.10	2.043	4 23 13.09	132.75	19 49 17.1	471.5	66.91	15 10.6	55 34.9	I. S.
26	4 59.50	2.070	5 16 40.40	134.32	22 25 4.3	305.1	67.38	15 0.7	54 58.8	I. S.
27	5 49.34	2.080	6 10 36.54	135.05	23 52 5.2	+120.0	67.58	14 53.6	54 32.6	I. N.
28	6 39.19	2.066	7 4 32.40	134.31	24 8 1.3	- 42.9	67.38	14 49.3	54 17.0	I. N.
29	7 28.45	2.033	7 57 52.95	132.16	+23 13 47.2	-220.6	66.79	14 48.1	54 12.5	I. N.
30	8 16.64	1.981	8 50 8.66	129.03	21 13 14.6	-379.3	65.92	14 49.9	54 18.8	I. N.
31	9 3.49	1.994	9 41 4.09	125.61	18 12 42.4	-520.3	64.94	14 54.2	54 34.8	I. N.
Apr. 1	9 49.05	1.875	10 30 41.76	122.67	14 20 13.4	-638.6	64.09	15 0.7	54 58.7	I. N.
2	10 33.65	1.845	11 19 21.40	120.87	+ 9 45 14.4	-731.9	63.53	15 8.8	55 28.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semi-d. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 2	10 33.65	1.845	11 19 21.40	180.87	+ 9 45 14.4	-731.9	63.53	15 8.8	55 28.8	I. N.
3	11 17.84	1.843	12 7 36.74	180.75	+ 4 38 33.4	-706.4	63.46	15 18.0	56 2.4	I. N.
4	12 2.38	1.874	12 56 12.06	182.50	- 0 47 29.3	-827.8	63.94	15 27.5	56 37.4	I. N.
5	12 48.07	1.941	13 45 58.33	186.64	- 6 18 31.5	-880.4	65.04	15 36.8	57 11.7	II. N.
6	13 35.84	2.043	14 37 48.67	182.98	-11 37 49.0	-767.9	66.73	15 45.5	57 43.2	II. S.
7	14 26.47	2.176	15 32 31.51	140.90	-16 26 5.3	-684.2	68.82	15 53.0	58 10.9	II. S.
8	15 20.45	2.221	16 30 36.00	140.46	-20 22 9.0	-508.4	71.05	15 59.3	58 34.0	II. S.
9	16 17.70	2.444	17 31 56.88	156.90	-23 4 47.1	-208.4	72.91	16 4.2	58 52.4	II. S.
10	17 17.31	2.511	18 35 39.85	100.94	-24 16 22.9	- 84.9	73.95	16 8.0	59 6.0	II. N.
11	18 17.67	2.508	19 40 7.52	100.42	-23 47 25.8	+106.9	73.85	16 10.5	59 15.1	II. N.
12	19 16.94	2.495	20 43 30.39	155.80	-21 39 34.4	+234.7	72.70	16 11.5	59 19.0	II. N.
13	20 13.78	2.308	21 44 26.82	148.60	-18 5 4.0	680.1	70.96	16 11.0	59 17.0	II. N.
14	21 7.66	2.184	22 42 24.49	141.26	-13 23 13.0	770.3	68.98	16 8.7	59 6.7	II. N.
15	21 58.77	2.081	23 37 36.41	135.08	- 7 56 15.6	884.8	67.34	16 4.3	58 52.8	II. N.
16	22 47.82	2.013	0 30 43.97	130.96	- 2 6 34.8	884.6	66.23	15 58.0	58 28.6	II. N.
17	23 35.68	1.988	1 22 39.97	180.10	+ 3 44 45.0	+883.9	65.72	15 49.7	57 58.8	II. N.
19	0 23.22	1.985	2 14 16.61	180.37	9 18 31.1	797.8	65.77	15 39.8	57 23.2	I. N.
20	1 11.15	2.013	3 6 17.09	130.97	14 17 41.1	691.9	66.25	15 29.2	56 43.3	I. S.
21	1 59.94	2.053	3 59 8.89	133.40	18 27 40.4	583.0	66.94	15 18.4	56 4.0	I. S.
22	2 49.69	2.001	4 52 58.63	135.63	21 36 49.9	389.2	67.55	15 8.3	55 26.8	I. S.
23	3 40.15	2.100	5 47 30.97	136.76	+23 37 1.9	+216.0	67.96	14 59.9	54 54.5	I. S.
24	4 30.73	2.099	6 42 10.80	136.21	24 24 13.3	+ 26.1	67.88	14 53.4	54 31.8	I. N.
25	5 20.73	2.080	7 36 15.64	133.90	23 58 33.2	-128.5	67.31	14 49.5	54 18.2	I. N.
26	6 9.54	2.003	8 29 8.46	130.11	22 23 52.9	-317.9	66.41	14 48.8	54 15.0	I. N.
27	6 56.80	1.936	9 20 28.49	125.94	19 46 36.0	-405.0	65.35	14 50.9	54 23.0	I. N.
28	7 42.52	1.877	10 10 16.01	122.53	+16 14 40.7	-501.0	64.34	14 56.0	54 41.6	I. N.
29	8 27.04	1.838	10 58 51.19	120.42	11 56 45.9	-604.7	63.64	15 3.8	55 10.3	I. N.
30	9 10.96	1.880	11 46 49.77	119.81	7 2 12.1	-772.9	63.41	15 13.7	55 46.4	I. N.
May 1	9 55.05	1.853	12 34 59.06	121.36	+ 1 41 24.6	-685.4	63.78	15 25.1	56 28.5	I. N.
2	10 40.24	1.919	13 24 14.41	125.34	- 3 53 25.7	-841.1	64.73	15 37.1	57 12.7	I. N.
3	11 27.51	2.007	14 15 34.91	131.80	- 9 26 1.5	-815.8	66.46	15 48.8	57 55.7	I. N.
4	12 17.79	2.100	15 9 56.81	140.37	-14 39 49.4	-737.7	68.66	15 59.2	58 34.0	II. N.
5	13 11.76	2.209	16 8 0.06	150.00	-19 5 51.5	-585.6	71.10	16 7.6	59 4.5	II. S.
6	14 9.46	2.474	17 9 48.55	158.06	-22 25 10.5	-302.7	73.28	16 13.3	59 25.3	II. S.
7	15 10.05	2.580	18 14 29.94	163.90	-24 13 49.2	-144.4	74.60	16 16.0	59 35.5	II. N. S.
8	16 11.70	2.559	19 20 16.06	163.88	-24 18 28.7	+121.1	74.65	16 16.1	59 36.0	II. N.
9	17 12.27	2.478	20 24 56.80	158.71	-22 38 59.0	370.1	73.46	16 14.0	59 28.0	II. N.
10	18 10.06	2.337	21 26 50.13	150.45	-19 27 48.3	876.6	71.45	16 10.0	59 13.6	II. N.
11	19 4.36	2.190	22 25 13.24	141.63	-15 5 9.2	797.0	69.94	16 4.8	58 54.4	II. N.
12	19 55.36	2.086	23 20 18.27	134.18	- 9 53 31.3	688.0	67.29	15 58.6	58 31.8	II. N.
13	20 43.84	1.981	0 12 51.66	120.07	- 4 14 22.4	+885.7	65.90	15 51.7	58 6.4	II. N.
14	21 30.80	1.930	1 3 53.69	126.55	+ 1 32 50.3	863.1	65.17	15 44.2	57 38.6	II. N.
15	22 17.26	1.936	1 54 25.36	126.47	7 10 30.1	818.4	65.10	15 36.1	57 8.8	II. N.
16	23 4.09	1.980	2 45 19.58	128.23	12 22 21.5	734.5	65.57	15 27.5	56 37.5	II. N.
17	23 51.94	2.020	3 37 14.70	131.30	+16 53 20.4	+814.5	66.35	15 18.8	56 5.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
May 17	23 51.94	2.020	3 37 14.70	131.39	+16 53 20.4	+614.8	66.35	15 18.8	56 5.8	II. N.
19	0 41.08	2.072	4 30 27.92	134.65	20 30 0.0	464.1	67.92	15 10.4	55 34.4	I. S.
20	1 31.38	2.111	5 24 50.64	136.98	23 1 26.8	280.2	67.98	15 2.5	55 5.4	I. S.
21	2 22.27	2.121	6 19 49.00	137.48	24 20 38.6	+104.8	68.07	14 55.8	54 40.9	I. N. S.
22	3 12.02	2.093	7 14 32.82	135.77	24 25 20.5	-80.0	67.68	14 50.8	54 22.4	I. N.
23	4 2.49	2.033	8 8 11.72	132.30	+23 18 7.6	-253.1	66.81	14 47.9	54 11.9	I. N.
24	4 50.40	1.958	9 0 10.74	127.64	21 5 19.7	-407.1	65.67	14 47.6	54 10.8	I. N.
25	5 36.47	1.883	9 50 19.05	123.16	17 55 23.3	-538.7	64.51	14 50.2	54 20.0	I. N.
26	6 20.92	1.825	10 38 50.17	119.68	13 57 25.2	-647.4	63.56	14 55.5	54 40.2	I. N.
27	7 4.32	1.797	11 26 17.52	117.94	9 20 30.0	-733.5	63.05	15 3.7	55 10.8	I. N.
28	7 47.45	1.804	12 13 28.80	118.43	+ 4 13 48.4	-796.0	63.15	15 14.6	55 50.8	I. N.
29	8 31.28	1.855	13 1 22.51	121.50	- 1 12 34.0	-831.0	63.95	15 27.8	56 38.6	I. N.
30	9 16.89	1.954	13 51 3.74	127.42	- 6 46 16.7	-831.1	65.47	15 42.0	57 30.7	I. N.
31	10 5.43	2.099	14 43 40.42	136.13	-12 11 13.4	-784.8	67.64	15 56.3	58 23.3	I. N.
June 1	10 57.89	2.278	15 40 12.91	146.92	-17 6 16.1	-679.0	70.38	16 9.5	59 11.6	I. N.
2	11 54.81	2.463	16 41 14.12	158.09	-21 5 33.6	-504.6	73.11	16 20.1	59 50.8	I. N.
3	12 55.81	2.607	17 46 21.02	166.73	-23 41 46.2	-265.7	75.18	16 27.0	60 15.8	II. S.
4	13 59.27	2.658	18 53 55.15	169.83	-24 33 11.5	+ 19.6	75.96	16 29.7	60 26.2	II. N.
5	15 2.61	2.600	20 1 22.72	166.94	-23 31 52.8	289.2	75.17	16 28.2	60 20.5	II. N.
6	16 3.40	2.456	21 6 16.48	157.61	-20 46 54.8	525.0	73.17	16 23.1	60 1.4	II. N.
7	17 0.24	2.260	22 7 12.85	147.10	-16 39 49.6	+695.4	70.63	16 15.1	59 32.2	II. N.
8	17 53.00	2.121	23 4 3.02	137.73	-11 36 36.2	807.1	68.16	16 5.7	58 56.8	II. N.
9	18 42.35	2.001	23 57 29.65	130.47	- 6 1 41.5	858.9	66.35	15 55.2	58 18.8	II. N.
10	19 29.43	1.931	0 48 38.52	125.99	- 0 15 50.7	863.3	65.19	15 44.8	57 40.7	II. N.
11	20 15.38	1.906	1 38 39.57	124.54	+ 5 23 35.6	827.8	64.76	15 34.8	57 3.8	II. N.
12	21 1.26	1.923	2 28 36.58	125.56	+10 41 35.3	+756.5	64.96	15 25.3	56 29.2	II. N.
13	21 47.92	1.970	3 19 20.41	126.33	15 24 21.4	651.8	65.64	15 16.6	55 57.3	II. N.
14	22 35.89	2.029	4 11 23.12	131.94	19 19 0.6	516.3	66.54	15 8.6	55 28.0	II. N.
15	23 25.29	2.084	5 4 51.42	135.24	22 14 0.3	354.5	67.37	15 1.6	55 2.1	II. N.
17	0 15.74	2.114	5 59 23.45	137.06	24 0 19.8	+174.8	67.84	14 55.5	54 39.6	I. S.
18	1 6.48	2.107	6 54 12.98	136.61	+24 33 4.1	- 11.0	67.75	14 50.6	54 21.5	I. N. S.
19	1 56.57	2.060	7 48 23.03	133.83	23 52 21.9	-190.1	67.08	14 47.1	54 9.2	I. N.
20	2 45.18	1.987	8 41 4.18	129.39	22 3 9.3	-352.1	65.97	14 45.4	54 2.7	I. N.
21	3 31.86	1.903	9 31 49.14	124.36	19 13 42.7	-490.7	64.69	14 45.8	54 4.3	I. N.
22	4 16.60	1.898	10 20 37.66	119.86	15 33 53.6	-604.2	63.54	14 48.6	54 14.5	I. N.
23	4 59.81	1.777	11 7 53.45	116.76	+11 13 33.4	-693.6	62.74	14 54.1	54 34.6	I. N.
24	5 42.17	1.760	11 54 18.43	115.71	6 22 10.3	-759.7	62.47	15 2.3	55 4.8	I. N.
25	6 24.59	1.783	12 40 47.38	117.16	+ 1 9 2.4	-802.1	62.88	15 13.3	55 45.0	I. N.
26	7 8.15	1.855	13 28 24.77	121.47	- 4 15 43.7	-817.0	64.03	15 26.5	56 33.9	I. N.
27	7 54.03	1.977	14 18 21.96	126.85	- 9 39 42.2	-796.3	65.96	15 41.7	57 29.4	I. N.
28	8 43.45	2.149	15 11 51.87	139.16	-14 46 21.9	-737.7	68.57	15 57.7	58 28.1	I. N.
29	9 37.43	2.353	16 9 55.90	151.46	-19 13 42.1	-596.8	71.59	16 13.1	59 24.8	I. N.
30	10 36.36	2.553	17 12 58.21	163.11	-22 34 37.7	-394.4	74.44	16 26.4	60 13.8	I. N.
July 1	11 39.48	2.689	18 20 11.94	171.63	-21 21 21.7	-192.4	76.36	16 36.1	60 49.1	I. S.
2	12 44.57	2.711	19 29 24.87	179.94	-24 14 22.4	+165.4	76.66	16 40.4	61 5.5	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	"	' "	
July 2	12 44.57	9.711	19 29 24.87	179.94	-24 14 22.4	+185.4	76.66	16 40.4	61 5.5	II. S.
3	13 48.70	9.615	20 37 39.50	167.09	-22 11 24.2	441.9	75.40	16 39.9	61 2.9	II. N.
4	14 49.44	9.487	21 42 30.51	156.75	-18 28 56.2	657.7	72.91	16 33.9	60 40.9	II. N.
5	15 45.76	9.240	22 42 55.54	145.55	-13 34 46.7	799.5	70.20	16 23.8	60 4.1	II. N.
6	16 37.90	2.105	23 39 9.10	136.08	- 7 58 33.4	870.5	67.86	16 11.3	59 17.9	II. N.
7	17 26.83	1.994	0 32 9.53	129.51	- 2 6 1.6	+883.8	66.17	15 57.5	58 27.4	II. N.
8	18 13.76	1.939	1 23 9.85	126.02	+ 3 42 21.4	851.7	65.23	15 43.8	57 37.2	II. N.
9	18 59.89	1.919	2 13 21.19	125.35	9 10 26.5	783.3	65.06	15 31.0	56 50.0	II. N.
10	19 46.20	1.945	3 3 44.18	126.80	14 4 51.1	683.9	65.43	15 19.5	56 7.9	II. N.
11	20 33.44	1.994	3 55 2.97	129.84	18 13 45.6	556.1	66.15	15 9.7	55 31.6	II. N.
12	21 21.97	2.040	4 47 39.36	133.11	+21 26 28.8	+403.4	66.95	15 1.5	55 1.5	II. N.
13	22 11.70	2.090	5 41 27.86	135.63	23 33 58.0	231.9	67.54	14 54.9	54 37.4	II. N.
14	23 2.08	2.101	6 35 55.69	136.27	24 30 4.1	+ 48.4	67.66	14 49.9	54 16.8	II. S.
15	23 52.27	2.074	7 30 11.37	134.60	24 12 52.0	-133.1	67.22	14 46.4	54 5.7	II. S.
17	0 41.35	2.011	8 23 21.04	130.90	22 45 15.2	-301.7	66.25	14 44.3	53 58.3	I. S.
18	1 28.68	1.931	9 14 45.44	126.03	+20 14 16.6	-448.8	64.98	14 43.6	53 56.5	I. N.
19	2 14.02	1.849	10 4 9.75	121.08	16 49 34.8	-670.0	63.72	14 45.1	54 0.8	I. N.
20	2 57.54	1.789	10 51 44.52	117.06	12 41 46.2	-664.6	62.67	14 48.2	54 12.9	I. N.
21	3 39.76	1.742	11 38 1.01	114.70	8 1 17.3	-733.7	62.07	14 53.6	54 32.5	I. N.
22	4 21.44	1.739	12 23 45.64	114.46	+ 2 58 5.3	-778.1	62.07	15 1.3	55 0.9	I. N.
23	5 3.56	1.778	13 9 55.87	116.85	- 2 17 57.4	-797.7	62.77	15 11.3	55 37.8	I. N.
24	5 47.19	1.866	13 57 37.52	122.13	- 7 36 5.1	-787.8	64.23	15 23.8	56 23.7	I. N.
25	6 33.53	2.004	14 48 2.04	130.45	-12 43 12.9	-741.3	66.45	15 38.3	57 16.9	I. N.
26	7 23.74	2.188	15 42 19.81	141.50	-17 22 16.4	-644.9	69.24	15 53.8	58 13.8	I. N.
27	8 18.73	2.397	16 41 24.38	154.04	-21 11 7.0	-486.0	72.35	16 10.0	59 14.1	I. N.
28	9 18.62	2.586	17 45 24.08	165.49	-23 43 32.1	-262.4	75.02	16 25.0	60 8.7	I. N. S.
29	10 22.28	2.899	18 53 11.12	172.96	-21 34 24.0	+ 15.9	76.58	16 37.0	60 52.3	I. S.
30	11 27.30	2.995	20 2 19.62	179.00	-23 28 54.5	308.3	76.48	16 44.2	61 19.0	I. S.
31	12 30.83	2.582	21 9 58.01	185.23	-20 30 24.5	571.9	74.86	16 45.6	61 25.0	II. S.
Aug. 1	13 30.81	2.412	22 14 3.37	155.00	-16 0 1.4	765.3	72.43	16 41.3	61 8.3	II. N.
2	14 26.59	2.241	23 13 55.90	144.80	-10 28 26.4	+878.4	69.94	16 31.7	60 33.1	II. N.
3	15 18.62	2.104	0 10 3.04	136.43	- 4 26 53.8	918.0	67.92	16 18.4	59 41.0	II. N.
4	16 7.93	2.014	1 3 26.25	131.04	+ 1 38 1.4	898.2	66.57	16 3.2	58 47.7	II. N.
5	16 55.69	1.973	1 55 15.75	128.55	7 25 33.4	833.1	66.00	15 47.3	57 49.3	II. N.
6	17 42.95	1.979	2 46 36.09	128.51	12 39 47.9	733.1	66.03	15 32.1	56 54.3	II. N.
7	18 30.58	2.001	3 38 18.01	130.21	+17 8 12.7	+604.7	66.45	15 18.3	56 4.7	II. N.
8	19 19.08	2.041	4 30 52.74	132.65	20 40 29.2	453.0	67.03	15 7.3	55 23.0	II. N.
9	20 8.53	2.080	5 24 24.25	134.96	23 8 13.5	983.0	67.56	14 58.3	54 49.8	II. N.
10	20 58.74	2.097	6 18 41.75	136.00	24 25 27.9	+101.9	67.74	14 51.5	54 25.1	II. S.
11	21 48.91	2.078	7 12 56.63	134.91	24 29 35.6	- 80.6	67.42	14 47.0	54 8.3	II. S.
12	22 38.27	2.080	8 6 23.05	131.95	+23 22 8.5	-254.1	66.58	14 44.4	53 58.9	II. S.
13	23 26.14	1.957	8 58 19.51	127.58	21 8 40.7	-409.3	65.37	14 43.6	53 55.9	II. S.
15	0 12.13	1.876	9 48 23.36	122.75	17 57 50.1	-540.2	64.09	14 44.4	53 58.9	
16	0 56.27	1.904	10 36 35.27	118.40	14 0 3.4	-644.0	62.93	14 46.7	54 7.4	
17	1 38.90	1.752	11 23 16.48	115.30	+ 9 26 14.9	-730.4	62.12	14 50.6	54 21.8	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 17	1 38.90	1.752	11 23 16.48	115.30	+ 9 26 14.9	-720.4	62.12	14 50.6	54 21.8	I. N.
18	2 20.63	1.731	12 9 4.18	114.02	+ 4 27 17.7	-769.9	61.81	14 56.0	54 41.7	I. N.
19	3 2.29	1.747	12 54 47.06	114.96	- 0 46 5.1	-792.5	62.14	15 3.2	55 7.9	I. N.
20	3 44.81	1.804	13 41 22.17	118.42	- 6 2 52.0	-786.5	63.15	15 12.1	55 41.0	I. N.
21	4 29.26	1.808	14 29 52.72	124.60	-11 10 52.0	-747.6	64.89	15 23.0	56 20.6	I. N.
22	5 16.71	2.054	15 21 23.71	133.44	-15 55 33.7	-688.4	67.26	15 35.6	57 6.6	I. N.
23	6 8.11	2.234	16 16 52.97	144.31	-19 58 58.6	-539.2	70.04	15 49.4	57 57.5	I. N.
24	7 4.01	2.421	17 16 52.83	155.61	-22 59 28.3	-352.4	72.82	16 3.9	58 50.7	I. N.
25	8 4.10	2.574	18 21 4.52	164.69	-24 33 51.1	-109.9	74.97	16 18.0	59 42.8	I. S.
26	9 6.92	2.642	19 28 0.29	168.79	-24 23 0.7	+168.2	75.91	16 30.6	60 27.9	I. S.
27	10 10.14	2.608	20 35 20.54	166.77	-22 19 31.2	+445.0	75.33	16 39.0	60 59.6	I. S.
28	11 11.49	2.494	21 40 47.90	159.91	-18 32 18.9	679.9	73.64	16 42.8	61 13.7	I. S.
29	12 9.59	2.348	22 43 0.42	151.11	-13 24 31.0	845.0	71.49	16 41.2	61 7.8	II. S.
30	13 4.24	2.212	23 41 44.88	143.17	- 7 26 26.1	931.8	69.48	16 34.0	60 41.1	II. N.
31	13 56.03	2.111	0 37 37.04	136.88	- 1 8 36.5	945.7	67.96	16 22.2	59 58.1	II. N.
Sept. 1	14 45.91	2.053	1 31 34.93	133.40	+ 5 2 19.5	+899.6	67.10	16 7.5	59 4.0	II. N.
2	15 34.90	2.035	2 24 39.04	132.32	10 44 59.5	806.8	66.94	15 51.5	58 4.8	II. N.
3	16 23.85	2.048	3 17 40.44	133.05	15 42 56.0	677.6	67.18	15 35.5	57 6.3	II. N.
4	17 13.31	2.075	4 11 12.92	134.74	19 43 41.0	581.9	67.65	15 20.8	56 12.5	II. N.
5	18 3.48	2.103	5 5 27.84	136.40	22 38 6.2	347.8	68.08	15 8.4	55 26.8	II. N.
6	18 54.14	2.114	6 0 12.30	137.03	+24 20 12.9	+162.0	68.24	14 58.5	54 50.7	II. S.
7	19 44.74	2.097	6 54 52.98	136.01	24 47 33.1	- 24.6	67.94	14 51.4	54 24.5	II. S.
8	20 34.56	2.050	7 48 47.02	133.19	24 1 25.6	-203.6	67.13	14 47.0	54 8.2	II. S.
9	21 22.97	1.982	8 41 15.88	129.04	22 6 45.5	-366.2	65.97	14 45.1	54 1.2	II. S.
10	22 9.57	1.909	9 31 56.56	124.34	19 11 20.3	-506.6	64.66	14 45.4	54 1.1	II. S.
11	22 54.34	1.830	10 20 46.67	119.96	+15 24 48.2	-621.5	63.42	14 47.5	54 10.2	II. S.
12	23 37.56	1.776	11 8 3.11	116.64	10 57 41.0	-709.8	62.48	14 51.2	54 24.0	II. S.
14	0 19.78	1.746	11 54 17.95	114.91	6 0 56.4	-769.6	62.00	14 56.3	54 42.6	I. S.
15	1 1.63	1.749	12 40 14.23	115.14	+ 0 45 52.4	-805.0	62.09	15 2.4	55 5.2	I. N.
16	1 44.04	1.791	13 26 42.68	117.69	- 4 35 44.7	-801.9	62.83	15 9.7	55 31.6	I. N.
17	2 27.92	1.872	14 14 38.89	122.48	- 9 51 4.6	-788.8	64.21	15 17.8	56 1.6	I. N.
18	3 14.20	1.991	15 5 0.01	129.68	-14 45 35.3	-606.8	66.20	15 26.9	56 35.0	I. N.
19	4 3.75	2.144	15 58 37.75	138.76	-19 2 33.1	-579.7	68.62	15 36.9	57 11.8	I. N.
20	4 57.12	2.205	16 56 5.43	148.57	-22 22 47.4	-419.3	71.15	15 47.8	57 52.6	I. N.
21	5 54.25	2.445	17 57 19.39	157.18	-24 26 3.6	-195.5	73.29	15 59.0	58 33.3	I. N. s.
22	6 54.22	2.534	19 1 23.44	162.31	-24 54 30.2	+ 58.4	74.51	16 10.0	59 13.4	I. S.
23	7 55.28	2.551	20 6 33.92	162.53	-23 37 54.0	323.9	74.57	16 20.0	59 49.7	I. S.
24	8 55.51	2.489	21 10 53.86	158.44	-20 38 1.3	568.9	73.45	16 27.6	60 16.5	I. S.
25	9 53.46	2.363	22 12 57.44	151.70	-16 9 10.2	764.7	71.73	16 31.8	60 33.3	I. S.
26	10 48.63	2.243	23 12 13.12	144.80	-10 34 43.7	895.1	69.98	16 32.0	60 34.2	I. S.
27	11 41.29	2.122	0 8 57.86	139.32	- 4 22 15.3	+255.1	68.59	16 27.6	60 17.7	I. S.
28	12 32.20	2.097	1 3 57.14	136.05	+ 2 0 31.2	948.0	67.77	16 18.9	59 45.4	II. N. S.
29	13 22.26	2.081	1 58 5.54	135.03	8 8 20.6	892.0	67.53	16 6.5	59 0.6	II. N.
30	14 12.30	2.063	2 52 12.51	135.81	13 39 39.5	767.4	67.80	15 52.3	58 8.1	II. N.
Oct. 1	15 2.87	2.122	3 46 52.17	137.58	+18 17 10.7	+614.9	68.32	15 37.3	57 13.3	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limb.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Oct. 1	15 2.87	2.123	3 46 52.17	137.56	+18 17 10.7	+614.9	68.39	15 37.3	57 13.3	II. N.
2	15 54.19	2.152	4 42 16.02	139.28	21 48 2.5	435.9	68.91	15 23.0	56 20.7	II. N.
3	16 46.01	2.162	5 38 10.18	139.92	24 3 56.9	242.2	69.05	15 10.4	55 34.4	II. N.
4	17 37.73	2.145	6 33 58.73	138.74	25 1 24.4	+ 45.4	68.77	15 0.1	54 56.8	II. S.
5	18 23.59	2.091	7 28 55.52	135.65	24 41 32.0	-142.7	67.97	14 52.7	54 29.6	II. S.
6	19 17.91	2.015	8 23 19.19	131.15	+23 9 31.0	-314.0	66.80	14 48.3	54 13.5	II. S.
7	20 5.28	1.931	9 13 45.55	126.05	20 33 14.5	-463.3	65.36	14 46.9	54 8.1	II. S.
8	20 50.66	1.822	10 3 12.27	121.31	17 2 7.6	-598.1	64.01	14 48.0	54 12.6	II. S.
9	21 34.34	1.702	10 50 57.10	117.06	12 46 9.5	-668.5	62.94	14 51.6	54 25.6	II. S.
10	22 16.88	1.758	11 37 33.00	115.64	7 55 34.1	-761.0	62.30	14 57.0	54 45.6	II. S.
11	22 59.00	1.758	12 23 43.48	115.50	+ 2 41 3.1	-808.9	62.26	15 3.9	55 10.9	I. S.
12	23 41.53	1.793	13 10 18.83	117.75	- 2 45 50.1	-822.2	62.85	15 11.8	55 39.6	II. S.
14	0 25.38	1.898	13 58 13.63	122.22	- 8 12 1.0	-822.4	64.07	15 20.1	56 10.0	I. N. S.
15	1 11.47	1.979	14 45 22.79	126.22	-13 22 17.4	-741.5	65.90	15 28.5	56 40.9	I. N.
16	2 0.60	2.119	15 41 35.27	137.30	-17 59 0.1	-633.5	68.16	15 36.8	57 11.3	I. N.
17	2 53.29	2.271	16 38 21.85	146.51	-21 42 22.8	-474.3	70.54	15 44.7	57 40.7	I. N.
18	3 49.47	2.404	17 38 38.52	154.50	-24 12 8.4	-266.3	72.59	15 52.4	58 8.8	I. N.
19	4 48.27	2.481	18 41 32.93	159.26	-25 10 40.1	- 22.2	73.81	15 59.5	58 35.1	I. S.
20	5 48.10	2.480	19 45 29.11	159.50	-24 28 16.4	+224.7	73.90	16 6.1	58 59.0	I. S.
21	6 47.15	2.422	20 48 38.22	155.50	-22 5 0.7	476.3	72.93	16 11.7	59 19.6	I. S.
22	7 44.06	2.318	21 49 38.80	149.24	-18 12 14.6	+678.9	71.34	16 15.7	59 34.6	I. S.
23	8 38.31	2.207	22 47 59.32	142.63	-13 8 48.9	828.1	69.61	16 18.0	59 42.6	I. S.
24	9 30.15	2.119	23 43 54.96	137.38	- 7 17 31.2	918.0	68.21	16 17.5	59 40.0	I. S.
25	10 20.33	2.069	0 38 10.37	134.25	- 1 2 22.0	947.7	67.37	16 14.0	59 28.2	I. S.
26	11 9.78	2.058	1 31 42.08	133.71	+ 5 12 54.2	919.1	67.17	16 7.5	59 4.3	I. S.
27	11 59.41	2.082	2 25 24.45	135.14	+11 5 45.1	+836.5	67.54	15 58.2	58 30.1	II. S.
28	12 49.90	2.122	3 19 58.81	137.67	16 15 48.3	708.1	68.27	15 46.8	57 48.5	II. N.
29	13 41.56	2.176	4 15 43.64	140.78	20 25 33.5	536.8	69.07	15 34.4	57 2.8	II. N.
30	14 34.21	2.206	5 12 27.95	142.50	23 22 0.2	343.2	69.59	15 21.8	56 16.3	II. N.
31	15 27.19	2.200	6 9 31.58	142.24	24 57 38.1	+136.2	69.60	15 10.5	55 34.7	II. N.
Nov. 1	16 19.52	2.153	7 5 56.80	139.40	+25 11 29.9	- 66.3	68.94	15 0.8	55 0.0	II. S.
2	17 10.28	2.072	8 0 47.48	134.53	24 7 51.0	-249.1	67.72	14 53.7	54 33.1	II. S.
3	17 58.87	1.975	8 53 26.82	128.68	21 55 12.3	-409.3	66.20	14 49.4	54 17.5	II. S.
4	18 45.10	1.890	9 43 45.28	122.90	18 43 50.1	-543.0	64.66	14 48.2	54 13.0	II. S.
5	19 29.27	1.804	10 31 58.83	118.40	14 44 13.3	-650.9	63.38	14 50.1	54 19.7	II. S.
6	20 11.93	1.757	11 18 42.32	115.56	+10 6 22.5	-734.4	62.53	14 54.7	54 36.8	II. S.
7	20 53.88	1.745	12 4 42.84	114.67	+ 4 59 58.7	-793.5	62.27	15 1.8	55 2.7	II. S.
8	21 36.03	1.774	12 50 55.23	116.58	- 0 24 50.3	-826.0	62.68	15 10.7	55 35.6	II. S.
9	22 19.37	1.845	13 34 19.06	120.25	- 5 56 29.9	-826.6	63.79	15 20.9	56 12.9	II. S.
10	23 4.91	1.968	14 27 55.60	127.84	-11 20 47.8	-787.6	65.57	15 31.4	56 51.8	II. S.
11	23 53.60	2.106	15 20 41.75	136.56	-16 20 5.1	-699.7	67.90	15 41.7	57 29.4	I. S.
13	0 46.12	2.272	16 17 17.78	146.54	-20 33 10.0	-555.2	70.44	15 50.9	58 3.1	I. N.
14	1 42.52	2.422	17 17 47.95	155.55	-23 36 57.1	-353.7	72.74	15 58.4	58 31.0	I. N.
15	2 41.97	2.518	18 21 21.42	161.31	-25 10 25.6	-107.3	74.32	16 4.1	58 51.9	I. N. S.
16	3 42.71	2.525	19 26 12.16	161.85	-25 0 27.7	+157.5	74.55	16 7.9	59 5.7	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 16	3 42.71	2.525	19 26 12.16	161.85	-25 0 27.7	+157.5	74.55	16 7.9	59 5.7	I. S.
17	4 42.61	2.452	20 30 12.43	157.38	-23 6 13.9	408.0	73.43	16 9.8	59 12.9	I. S.
18	5 40.01	2.397	21 31 42.42	149.84	-19 39 11.4	618.3	71.54	16 10.2	59 14.3	I. S.
19	6 34.22	2.194	22 30 0.63	141.83	-14 58 43.8	772.8	69.53	16 9.3	59 11.0	I. S.
20	7 25.48	2.085	23 25 21.01	135.97	-9 27 9.2	872.7	67.82	16 7.1	59 2.9	I. S.
21	8 14.60	2.017	0 18 32.84	131.19	-3 26 32.4	+990.4	66.73	16 3.7	58 50.1	I. S.
22	9 2.64	1.995	1 10 40.02	129.88	+2 42 11.6	915.2	66.30	15 58.8	58 32.2	I. S.
23	9 50.69	2.015	2 2 47.31	131.13	8 39 8.6	861.4	66.57	15 52.5	58 8.9	I. S.
24	10 39.64	2.069	2 55 49.62	134.33	14 5 8.4	760.7	67.35	15 44.7	57 40.5	I. S.
25	11 30.12	2.137	3 50 22.18	138.40	18 42 0.3	616.5	68.39	15 35.7	57 7.5	I. S.
26	12 22.17	2.197	4 46 30.79	142.05	+22 13 41.6	+436.5	69.33	15 26.1	56 32.0	II. N.
27	13 15.34	2.225	5 43 45.79	143.71	24 28 13.0	323.5	69.78	15 16.2	55 55.8	II. N.
28	14 8.60	2.204	6 41 7.07	142.47	25 19 42.9	+24.7	69.54	15 6.9	55 21.3	II. N. S.
29	15 0.77	2.135	7 37 22.45	138.34	24 49 19.0	-173.1	68.56	14 58.8	54 51.8	II. S.
30	15 50.86	2.035	8 31 32.77	132.30	23 4 14.6	-347.2	67.06	14 52.6	54 29.1	II. S.
Dec. 1	16 38.38	1.925	9 23 8.17	125.70	+20 15 17.7	-492.2	65.36	14 48.8	54 15.4	II. S.
2	17 23.37	1.898	10 12 11.51	119.82	16 34 18.3	-608.0	63.82	14 47.9	54 11.8	II. S.
3	18 6.32	1.757	10 59 11.86	115.55	12 12 24.4	-697.5	62.66	14 49.9	54 19.3	II. S.
4	18 47.99	1.722	11 44 55.41	113.48	7 19 33.5	-763.2	62.05	14 55.0	54 37.9	II. S.
5	19 29.32	1.730	12 30 19.01	113.97	+2 5 0.5	-805.9	62.14	15 2.9	55 7.2	II. S.
6	20 11.39	1.784	13 16 26.39	117.16	-3 21 38.7	-823.0	62.98	15 13.4	55 45.7	II. S.
7	20 55.32	1.885	14 4 25.90	123.31	-8 49 0.3	-607.9	64.59	15 25.8	56 31.0	II. S.
8	21 42.24	2.034	14 55 26.76	132.26	-14 2 18.0	-750.4	66.90	15 39.1	57 19.9	II. S.
9	22 33.23	2.220	15 50 29.98	143.34	-18 42 5.8	-637.9	69.69	15 52.3	58 8.3	II. S.
10	23 28.79	2.409	16 50 8.91	154.82	-22 24 21.2	-461.2	72.54	16 4.2	58 52.1	II. S.
12	0 28.56	2.559	17 54 1.73	163.85	-24 43 17.6	-223.1	74.71	16 13.7	59 27.6	I. N.
13	1 30.96	2.619	19 0 32.70	167.48	-25 18 0.2	+53.6	75.63	16 20.0	59 50.1	I. N. s.
14	2 33.49	2.570	20 7 10.88	164.51	-24 0 22.4	331.0	74.96	16 22.2	59 58.5	I. S.
15	3 33.72	2.438	21 11 31.22	156.57	-20 58 10.7	568.0	73.11	16 21.3	59 54.8	I. S.
16	4 30.29	2.276	22 12 11.13	146.78	-16 33 45.1	748.0	70.75	16 17.4	59 40.4	I. S.
17	5 23.06	2.128	23 9 2.59	137.91	-11 11 24.7	+856.2	68.54	16 11.3	59 18.3	I. S.
18	6 12.76	2.027	0 2 49.78	131.56	-5 16 38.4	908.2	66.90	16 4.0	58 51.6	I. S.
19	7 0.55	1.966	0 54 41.11	128.26	+0 48 41.9	910.4	66.02	15 56.1	58 22.1	I. S.
20	7 47.02	1.963	1 45 49.80	127.96	6 45 40.7	867.5	65.89	15 47.9	57 51.8	I. S.
21	8 35.09	2.001	2 37 22.91	130.18	12 17 12.5	763.6	66.40	15 39.4	57 21.2	I. S.
22	9 23.82	2.065	3 30 11.68	134.09	+17 7 12.5	+660.0	67.37	15 31.2	56 50.7	I. S.
23	10 14.28	2.138	4 24 43.03	138.47	21 0 24.4	500.2	68.45	15 23.0	56 20.6	I. S.
24	11 6.31	2.192	5 20 50.20	141.79	23 43 47.2	311.9	69.26	15 15.0	55 51.1	I. S.
25	11 59.19	2.207	6 17 50.06	142.63	25 7 58.1	+107.6	69.45	15 7.3	55 23.0	I. S.
26	12 51.85	2.170	7 14 32.79	140.35	25 9 58.2	-95.7	68.90	15 0.2	54 57.1	I. S.
27	13 42.98	2.085	8 9 45.93	135.34	+23 53 33.0	-282.0	67.64	14 54.1	54 34.5	I. S.
28	14 31.76	1.978	9 2 37.24	128.81	21 27 57.8	-440.4	65.99	14 49.4	54 17.4	II. S.
29	15 17.89	1.867	9 52 47.86	122.19	18 5 20.5	-567.2	64.14	14 46.5	54 7.3	II. S.
30	16 1.52	1.775	10 40 30.69	116.66	13 58 11.0	-663.8	62.84	14 46.1	54 5.3	II. S.
31	16 43.32	1.714	11 26 22.31	113.09	9 17 53.7	-733.4	61.88	14 48.2	54 13.0	II. S.
32	17 24.13	1.675	12 11 13.99	111.73	+4 14 31.1	-780.0	61.56	14 53.2	54 31.3	II. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	1 3.5	19 44 55.21	-23 23 53.6	7.0	2.6	0.19	Feb. 14	22 33.4	20 15 50.80	-18 15 48.8	10.7	4.1	0.28
1	1 6.3	19 51 41.25	23 4 7.7	7.1	2.6	0.19	15	22 31.9	20 18 13.15	18 20 28.6	10.5	4.0	0.28
2	1 9.0	19 58 22.20	23 42 53.3	7.2	2.7	0.19	16	22 30.7	20 20 54.75	18 23 46.8	10.3	3.9	0.27
3	1 11.6	20 4 57.16	23 20 13.2	7.3	2.7	0.20	17	22 29.7	20 23 54.02	18 25 42.8	10.1	3.8	0.27
4	1 14.1	20 11 25.12	21 56 10.8	7.4	2.8	0.20	18	22 29.0	20 27 9.49	18 26 16.5	9.9	3.8	0.26
5	1 16.5	20 17 44.94	-21 30 50.6	7.5	2.8	0.21	19	22 28.6	20 30 39.81	-18 25 27.9	9.7	3.7	0.26
6	1 18.8	20 23 55.33	21 4 18.1	7.6	2.9	0.21	20	22 28.4	20 34 23.72	18 23 16.9	9.6	3.6	0.26
7	1 20.8	20 29 54.84	20 36 39.8	7.8	3.0	0.21	21	22 28.4	20 38 20.05	18 19 43.3	9.4	3.6	0.25
8	1 22.7	20 35 41.82	20 8 3.9	7.9	3.0	0.22	22	22 28.5	20 42 27.77	18 14 47.4	9.3	3.5	0.25
9	1 24.3	20 41 14.43	19 38 40.3	8.1	3.1	0.22	23	22 28.9	20 46 45.91	18 8 29.3	9.1	3.4	0.24
10	1 25.6	20 46 30.61	-19 8 40.2	8.3	3.1	0.23	24	22 29.4	20 51 13.62	-18 0 49.3	9.0	3.4	0.24
11	1 26.6	20 51 28.08	18 38 16.3	8.5	3.2	0.23	25	22 30.1	20 55 50.09	17 51 47.5	8.9	3.3	0.24
12	1 27.3	20 56 4.36	18 7 44.0	8.8	3.3	0.23	26	22 30.9	21 0 34.61	17 41 24.1	8.7	3.3	0.23
13	1 27.5	21 0 16.72	17 37 20.7	9.0	3.4	0.24	27	22 31.8	21 5 26.50	17 29 39.5	8.6	3.3	0.23
14	1 27.3	21 4 2.28	17 7 25.7	9.3	3.5	0.24	28	22 32.8	21 10 25.20	17 16 34.0	8.5	3.2	0.22
15	1 26.7	21 7 18.02	-16 38 20.3	9.5	3.6	0.25	Mar. 1	22 33.9	21 15 30.19	-17 2 7.9	8.4	3.2	0.22
16	1 25.5	21 10 0.85	16 10 27.4	9.8	3.7	0.25	2	22 35.2	21 20 40.99	16 46 21.5	8.3	3.1	0.22
17	1 23.7	21 12 7.71	15 44 11.0	10.1	3.8	0.26	3	22 36.5	21 25 57.16	16 29 15.0	8.2	3.1	0.22
18	1 21.2	21 13 35.70	15 19 56.0	10.4	3.9	0.26	4	22 37.9	21 31 18.32	16 10 49.0	8.1	3.1	0.21
19	1 18.0	21 14 22.27	14 58 7.4	10.8	4.0	0.27	5	22 39.4	21 36 44.13	15 51 3.7	8.0	3.0	0.21
20	1 14.1	21 14 25.44	-14 39 8.6	11.1	4.2	0.28	6	22 40.9	21 42 14.28	-15 29 59.5	7.9	3.0	0.21
21	1 9.5	21 13 43.96	14 23 20.7	11.4	4.3	0.29	7	22 42.5	21 47 48.51	15 7 36.8	7.8	3.0	0.20
22	1 4.1	21 12 17.53	14 11 0.8	11.7	4.4	0.30	8	22 44.2	21 53 26.58	14 43 56.2	7.7	2.9	0.20
23	0 58.0	21 10 7.08	14 2 21.6	12.0	4.5	0.30	9	22 46.0	21 59 8.28	14 18 57.9	7.7	2.9	0.20
24	0 51.2	21 7 14.90	13 57 29.7	12.3	4.7	0.31	10	22 47.9	22 4 53.44	13 52 42.2	7.6	2.9	0.19
25	0 43.8	21 3 44.74	-13 56 24.1	12.6	4.8	0.32	11	22 49.7	22 10 41.90	-13 25 9.6	7.5	2.8	0.19
26	0 35.9	20 59 41.79	13 58 57.0	12.9	4.9	0.33	12	22 51.6	22 16 33.54	12 56 20.7	7.5	2.8	0.19
27	0 27.5	20 55 12.54	14 4 53.7	13.1	5.0	0.33	13	22 53.6	22 22 28.26	12 26 15.9	7.4	2.8	0.19
28	0 18.7	20 50 24.54	14 13 53.1	13.3	5.0	0.34	14	22 55.6	22 28 25.98	11 54 55.7	7.3	2.8	0.19
29	0 9.8	20 45 25.97	14 25 29.2	13.4	5.0	0.34	15	22 57.7	22 34 26.65	11 22 20.4	7.3	2.7	0.18
30	0 0.9	20 40 25.19	-14 39 13.0	13.5	5.1	0.35	16	22 59.8	22 40 30.23	-10 48 30.6	7.2	2.7	0.18
30	23 52.1	20 35 30.38	14 54 34.3	13.5	5.1	0.35	17	23 2.0	22 46 36.71	10 13 26.8	7.1	2.7	0.18
31	23 43.5	20 30 48.97	15 11 3.9	13.5	5.1	0.35	18	23 4.2	22 52 46.09	9 37 9.6	7.0	2.7	0.18
Feb. 1	23 35.2	20 26 27.35	15 28 14.3	13.4	5.0	0.35	19	23 6.4	22 58 58.40	8 59 39.5	7.0	2.6	0.18
2	23 27.3	20 22 30.83	15 45 40.9	13.3	5.0	0.34	20	23 8.7	23 5 13.67	8 20 57.3	6.9	2.6	0.18
3	23 20.0	20 19 3.37	-16 3 2.4	13.1	4.9	0.34	21	23 11.1	23 11 31.97	-7 41 3.7	6.9	2.6	0.18
4	23 13.2	20 16 7.64	16 20 1.4	12.9	4.9	0.33	22	23 13.5	23 17 53.37	6 59 59.4	6.8	2.6	0.18
5	23 6.8	20 13 45.19	16 36 23.8	12.7	4.8	0.33	23	23 15.9	23 24 17.94	6 17 45.2	6.8	2.6	0.18
6	23 1.0	20 11 56.61	16 51 58.4	12.5	4.7	0.32	24	23 18.4	23 30 45.81	5 34 22.2	6.8	2.6	0.17
7	22 55.8	20 10 41.73	17 6 36.1	12.3	4.7	0.32	25	23 21.0	23 37 17.11	4 49 51.2	6.7	2.6	0.17
8	22 51.2	20 9 59.64	-17 20 10.4	12.1	4.6	0.31	26	23 23.7	23 43 51.96	-4 4 13.4	6.7	2.5	0.17
9	22 47.1	20 9 49.20	17 32 35.9	11.9	4.5	0.30	27	23 26.4	23 50 30.49	3 17 30.3	6.7	2.5	0.17
10	22 43.6	20 10 8.72	17 43 48.9	11.6	4.4	0.30	28	23 28.1	23 57 12.85	2 29 43.5	6.7	2.5	0.17
11	22 40.4	20 10 56.49	17 53 46.5	11.4	4.3	0.29	29	23 31.9	0 3 59.20	1 40 54.9	6.6	2.5	0.17
12	22 37.6	20 12 10.67	18 2 26.7	11.2	4.2	0.29	30	23 34.8	0 10 49.69	0 51 6.4	6.6	2.5	0.17
13	22 35.3	20 13 49.38	-18 9 47.9	10.9	4.1	0.28	31	23 37.8	0 17 44.47	-0 0 20.4	6.6	2.5	0.17
14	22 33.4	20 15 50.80	-18 15 48.8	10.7	4.1	0.28	32	23 40.9	0 24 43.65	+0 51 20.2	6.6	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
Apr. 1	h m	h m s	° ' " "	"	"	s	May 18	h m	h m s	° ' " "	"	"	s
2	23 40.9	0 24 43.65	+ 0 51 20.2	6.6	2.5	0.17	19	0 59.9	4 45 21.55	+23 18 59.5	14.1	5.3	0.39
3	23 44.0	0 31 47.37	1 43 51.8	6.6	2.5	0.17	20	0 55.8	4 45 14.98	23 4 20.4	14.4	5.4	0.39
4	23 47.2	0 38 55.75	2 37 10.5	6.6	2.5	0.17	21	0 51.4	4 44 49.50	22 48 20.9	14.7	5.5	0.40
5	23 50.4	0 46 8.87	3 31 12.0	6.6	2.5	0.17	22	0 46.8	4 44 6.08	22 31 7.1	14.9	5.6	0.41
6	23 53.7	0 53 26.74	4 25 51.0	6.6	2.5	0.17	23	0 41.9	4 43 5.85	22 12 46.2	15.1	5.7	0.41
7	23 57.1	1 0 49.33	+ 5 21 1.7	6.6	2.5	0.17	24	0 36.6	4 41 50.20	+21 53 25.1	15.3	5.8	0.42
8	0 0.7	1 8 16.57	6 16 37.1	6.6	2.5	0.17	25	0 31.2	4 40 20.74	21 33 15.9	15.5	5.8	0.42
9	0 4.3	1 15 48.31	7 12 29.5	6.7	2.5	0.17	26	0 25.6	4 38 39.24	21 12 25.8	15.7	5.9	0.43
10	0 7.9	1 23 24.31	8 8 30.1	6.7	2.5	0.17	27	0 19.8	4 36 47.63	20 51 7.0	15.9	6.0	0.43
11	0 11.6	1 31 4.23	9 4 29.5	6.7	2.5	0.17	28	0 13.9	4 34 48.01	20 29 31.6	16.0	6.0	0.43
12	0 15.3	1 38 47.59	+10 0 17.0	6.7	2.5	0.17	29	0 7.9	4 32 42.56	+20 7 52.3	16.1	6.0	0.44
13	0 19.1	1 46 33.85	10 55 41.2	6.8	2.6	0.18	30	0 1.9	4 30 33.58	19 46 22.6	16.1	6.1	0.44
14	0 23.0	1 54 22.33	11 50 29.9	6.8	2.6	0.18	31	23 55.8	4 28 23.39	19 25 16.2	16.1	6.1	0.43
15	0 26.9	2 2 12.20	12 44 30.5	6.9	2.6	0.18	June 1	23 49.7	4 26 14.27	19 4 47.0	16.1	6.1	0.43
16	0 30.8	2 10 2.55	13 37 30.1	7.0	2.6	0.18	2	23 43.7	4 24 8.47	18 45 8.7	16.0	6.0	0.43
17	0 34.6	2 17 52.35	+14 29 15.7	7.1	2.7	0.19	3	23 37.7	4 22 8.11	+18 26 33.7	15.9	6.0	0.42
18	0 38.5	2 25 40.48	15 19 34.5	7.2	2.7	0.19	4	23 31.9	4 20 15.21	18 9 14.1	15.8	6.0	0.42
19	0 42.3	2 33 25.78	16 8 14.3	7.3	2.7	0.19	5	23 26.2	4 18 31.62	17 53 20.9	15.7	5.9	0.42
20	0 46.1	2 41 7.00	16 55 3.9	7.4	2.8	0.20	6	23 20.7	4 16 59.03	17 39 3.9	15.5	5.9	0.41
21	0 49.7	2 48 42.90	17 39 53.2	7.5	2.8	0.20	7	23 15.5	4 15 38.93	17 26 31.0	15.3	5.8	0.40
22	0 53.2	2 56 12.26	+18 22 33.5	7.6	2.9	0.20	8	23 10.5	4 14 32.57	+17 15 48.3	15.1	5.7	0.40
23	0 56.6	3 3 33.67	19 2 57.1	7.8	2.9	0.21	9	23 5.7	4 13 41.03	17 7 0.7	14.9	5.6	0.39
24	0 59.9	3 10 46.55	19 40 58.1	8.0	3.0	0.21	10	23 1.1	4 13 5.23	17 0 11.5	14.7	5.5	0.39
25	1 3.1	3 17 49.19	20 16 32.1	8.1	3.0	0.22	11	22 56.9	4 12 45.87	16 55 22.7	14.4	5.4	0.38
26	1 6.0	3 24 40.73	20 49 36.3	8.3	3.1	0.22	12	22 53.0	4 12 43.52	16 52 34.6	14.1	5.3	0.37
27	1 8.7	3 31 20.24	+21 20 8.8	8.5	3.2	0.23	13	22 49.3	4 12 58.58	+16 51 46.4	13.8	5.2	0.37
28	1 11.2	3 37 46.78	21 48 9.1	8.7	3.2	0.23	14	22 45.9	4 13 31.36	16 52 55.6	13.5	5.1	0.36
29	1 13.4	3 43 59.51	22 13 37.8	8.9	3.3	0.24	15	22 42.8	4 14 22.04	16 55 59.3	13.2	5.0	0.35
30	1 15.4	3 49 57.64	22 36 36.1	9.1	3.4	0.24	16	22 40.0	4 15 30.73	17 0 53.8	12.9	4.9	0.34
May 1	1 17.2	3 55 40.46	22 57 6.3	9.3	3.5	0.25	17	22 37.5	4 16 57.49	17 7 34.3	12.6	4.8	0.34
2	1 18.7	4 1 7.28	+23 15 10.9	9.5	3.6	0.26	18	22 35.3	4 18 42.29	+17 15 55.4	12.3	4.7	0.33
3	1 19.9	4 6 17.44	23 30 52.5	9.8	3.7	0.26	19	22 33.4	4 20 45.09	17 25 51.5	12.0	4.6	0.32
4	1 20.9	4 11 10.38	23 44 14.5	10.0	3.8	0.27	20	22 31.8	4 23 5.82	17 37 16.2	11.7	4.5	0.32
5	1 21.5	4 15 45.53	23 55 20.2	10.2	3.9	0.28	21	22 30.5	4 25 44.42	17 50 3.0	11.5	4.4	0.31
6	1 21.8	4 20 2.35	24 4 13.3	10.5	4.0	0.29	22	22 29.5	4 28 40.80	18 4 4.8	11.2	4.3	0.30
7	1 21.8	4 24 0.36	+24 10 57.0	10.8	4.1	0.30	23	22 28.8	4 31 54.88	+18 19 14.3	11.0	4.2	0.29
8	1 21.5	4 27 39.09	24 15 35.1	11.1	4.2	0.30	24	22 28.4	4 35 26.62	18 35 24.0	10.7	4.1	0.29
9	1 20.9	4 30 58.11	24 18 10.8	11.4	4.3	0.31	25	22 28.3	4 39 15.98	18 52 26.3	10.5	4.0	0.28
10	1 20.0	4 33 57.04	24 16 47.7	11.7	4.4	0.32	26	22 28.5	4 43 22.90	19 10 13.0	10.2	3.9	0.27
11	1 18.7	4 36 35.53	24 17 28.8	12.0	4.5	0.33	27	22 29.0	4 47 47.36	19 28 35.8	10.0	3.8	0.27
12	1 17.0	4 38 53.34	+24 14 17.5	12.3	4.6	0.34	28	22 29.7	4 52 29.35	+19 47 26.2	9.7	3.7	0.26
13	1 15.1	4 40 50.25	24 9 17.1	12.6	4.7	0.35	29	22 30.7	4 57 28.88	20 6 35.0	9.5	3.6	0.26
14	1 12.7	4 42 26.15	24 2 30.8	12.9	4.9	0.35	30	22 32.1	5 2 45.96	20 25 53.0	9.3	3.5	0.25
15	1 10.0	4 43 41.05	23 54 2.2	13.2	5.0	0.36	31	22 33.7	5 8 20.58	20 45 10.6	9.1	3.4	0.25
16	1 6.9	4 44 35.06	23 43 54.9	13.5	5.1	0.37	32	22 35.6	5 14 12.72	21 4 17.6	8.9	3.3	0.24
17	1 3.6	4 45 8.43	+23 32 12.6	13.8	5.2	0.38	33	22 37.8	5 20 22.33	+21 23 3.5	8.7	3.3	0.24
18	0 59.9	4 45 21.55	+23 18 59.5	14.1	5.3	0.39	34	22 40.3	5 26 49.32	+21 41 17.4	8.5	3.2	0.23

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	22 37.8	5 20 22.33	+21 23 3.5	8.7	3.3	0.24	Aug. 17	1 27.7	11 12 1.18	+5 15 31.4	7.5	2.8	0.19
2	22 40.3	5 26 49.32	21 41 17.4	8.5	3.2	0.23	18	1 29.0	11 17 16.31	4 33 15.2	7.6	2.9	0.19
3	22 43.1	5 33 33.52	21 58 47.9	8.3	3.1	0.23	19	1 30.1	11 22 24.90	3 51 17.4	7.7	2.9	0.19
4	22 46.2	5 40 34.70	22 15 23.2	8.2	3.1	0.22	20	1 31.2	11 27 27.01	3 9 40.7	7.8	2.9	0.19
5	22 49.5	5 47 52.50	22 30 51.2	8.0	3.0	0.22	21	1 32.2	11 32 22.70	2 28 27.8	7.9	3.0	0.19
6	22 53.1	5 55 26.45	+22 44 59.5	7.9	2.9	0.21	22	1 33.1	11 37 11.99	+1 47 41.5	8.0	3.0	0.20
7	22 57.0	6 3 15.95	22 57 36.0	7.7	2.9	0.21	23	1 33.0	11 41 54.85	1 7 24.5	8.1	3.1	0.20
8	23 1.1	6 11 20.22	23 8 28.7	7.6	2.8	0.21	24	1 34.5	11 46 31.24	+0 27 39.7	8.1	3.1	0.20
9	23 5.6	6 19 38.31	23 17 25.4	7.4	2.8	0.20	25	1 35.1	11 51 1.10	-0 11 30.0	8.2	3.1	0.20
10	23 10.2	6 28 9.08	23 24 15.2	7.3	2.8	0.20	26	1 35.6	11 55 24.32	0 50 1.7	8.3	3.2	0.21
11	23 14.9	6 36 51.24	+23 28 47.8	7.2	2.7	0.20	27	1 35.9	11 59 40.75	-1 27 52.4	8.4	3.2	0.21
12	23 19.8	6 45 43.29	23 30 54.1	7.1	2.7	0.20	28	1 36.1	12 3 50.24	2 4 58.9	8.6	3.3	0.22
13	23 24.8	6 54 43.60	23 30 28.6	7.0	2.7	0.19	29	1 36.2	12 7 52.57	2 41 17.6	8.7	3.3	0.22
14	23 29.9	7 3 50.41	23 27 19.6	6.9	2.6	0.19	30	1 36.2	12 11 47.46	3 16 45.0	8.8	3.3	0.22
15	23 35.1	7 13 1.95	23 21 29.1	6.9	2.6	0.19	31	1 36.1	12 15 34.60	3 51 17.2	9.0	3.4	0.23
16	23 40.4	7 22 16.37	+23 12 53.3	6.8	2.6	0.19	Sept. 1	1 35.8	12 19 13.64	-4 24 50.1	9.1	3.4	0.23
17	23 45.7	7 31 31.83	23 1 32.4	6.8	2.6	0.19	2	1 35.4	12 22 44.20	4 57 19.4	9.2	3.5	0.24
18	23 51.0	7 40 46.55	22 47 28.4	6.7	2.5	0.19	3	1 34.8	12 26 5.78	5 28 40.2	9.3	3.5	0.24
19	23 56.3	7 49 58.90	22 30 45.1	6.7	2.5	0.18	4	1 34.0	12 29 17.67	5 58 47.4	9.5	3.6	0.24
20	0 1.5	7 59 7.36	22 11 28.0	6.6	2.5	0.18	5	1 33.1	12 32 19.66	6 27 35.3	9.6	3.6	0.25
21	0 6.6	8 8 10.57	+21 49 44.0	6.6	2.5	0.18	6	1 32.0	12 35 11.12	-6 54 57.6	9.8	3.7	0.25
22	0 11.5	8 17 7.37	21 25 40.7	6.6	2.5	0.18	7	1 30.7	12 37 50.88	7 20 47.3	10.0	3.7	0.26
23	0 16.4	8 25 56.76	20 59 26.5	6.6	2.5	0.18	8	1 29.2	12 40 18.33	7 44 57.0	10.2	3.8	0.26
24	0 21.2	8 34 37.93	20 31 10.4	6.6	2.5	0.18	9	1 27.5	12 42 32.61	8 7 18.9	10.4	3.9	0.26
25	0 25.8	8 43 10.24	20 1 1.7	6.6	2.5	0.18	10	1 25.6	12 44 32.75	8 27 44.0	10.6	3.9	0.27
26	0 30.2	8 51 33.19	+19 29 9.5	6.6	2.5	0.18	11	1 23.4	12 46 17.75	-8 46 2.5	10.8	4.0	0.27
27	0 34.4	8 59 46.47	18 55 42.9	6.6	2.5	0.18	12	1 21.0	12 47 46.50	9 2 3.8	11.0	4.1	0.28
28	0 38.5	9 7 49.86	18 20 50.7	6.6	2.5	0.18	13	1 18.2	12 48 57.86	9 15 36.4	11.2	4.2	0.28
29	0 42.4	9 15 43.24	17 44 41.6	6.6	2.5	0.18	14	1 15.1	12 49 50.65	9 28 28.2	11.4	4.3	0.29
30	0 46.2	9 23 26.60	17 7 23.7	6.7	2.5	0.18	15	1 11.7	12 50 23.70	9 34 26.2	11.6	4.3	0.29
Ang. 1	0 49.8	9 31 0.01	+16 29 4.7	6.7	2.5	0.18	16	1 8.0	12 50 35.83	-9 39 16.4	11.8	4.4	0.30
2	0 53.3	9 38 23.57	15 49 51.8	6.7	2.5	0.18	17	1 3.9	12 50 25.99	9 40 44.9	12.0	4.5	0.30
3	0 56.6	9 45 37.45	15 9 51.8	6.8	2.5	0.18	18	0 59.4	12 49 53.20	9 38 37.7	12.3	4.6	0.31
4	0 59.7	9 52 41.84	14 29 10.9	6.8	2.5	0.18	19	0 54.6	12 48 56.73	9 32 41.2	12.5	4.7	0.31
5	1 2.6	9 59 36.97	13 47 55.0	6.8	2.6	0.18	20	0 49.4	12 47 36.13	9 22 43.3	12.7	4.8	0.32
6	1 5.4	10 6 23.05	+13 6 9.9	6.9	2.6	0.18	21	0 43.7	12 45 51.33	-9 8 34.1	12.9	4.9	0.33
7	1 8.1	10 13 0.35	12 24 0.6	6.9	2.6	0.18	22	0 37.6	12 43 42.76	8 50 6.8	13.1	4.9	0.33
8	1 10.8	10 19 29.11	11 41 31.9	7.0	2.6	0.18	23	0 31.1	12 41 11.51	8 27 19.3	13.2	5.0	0.34
9	1 13.0	10 25 49.58	10 58 48.2	7.0	2.6	0.18	24	0 24.3	12 38 19.32	8 0 15.6	13.3	5.0	0.34
10	1 15.3	10 32 1.98	10 15 53.6	7.1	2.7	0.18	25	0 17.3	12 35 8.69	7 29 7.2	13.4	5.0	0.34
11	1 17.4	10 38 6.56	+9 39 51.9	7.1	2.7	0.19	26	0 9.9	12 31 43.02	-6 54 14.1	13.4	5.1	0.34
12	1 19.4	10 44 3.57	8 49 47.0	7.2	2.7	0.19	27	0 2.4	12 28 6.48	6 16 5.8	13.5	5.1	0.34
13	1 21.3	10 49 53.17	8 6 42.6	7.2	2.7	0.19	28	23 54.8	12 24 24.01	5 35 21.1	13.5	5.1	0.34
14	1 23.1	10 55 35.55	7 23 41.8	7.3	2.8	0.19	29	23 47.1	12 20 41.06	4 52 47.4	13.4	5.0	0.33
15	1 24.8	11 1 10.92	6 40 47.5	7.4	2.8	0.19	30	23 39.5	12 17 3.58	4 9 19.8	13.3	5.0	0.33
16	1 26.3	11 6 39.42	+5 58 3.0	7.5	2.8	0.19	31	23 32.2	12 13 37.63	-3 26 57.4	13.1	4.9	0.33
17	1 27.7	11 12 1.18	5 15 31.4	7.5	2.8	0.19		23 25.1	12 10 29.06	-4 43 41.7	12.9	4.9	0.32

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	23 25.1	12 10 29.08	- 2 43 41.7	12.9	4.9	0.32	Nov. 16	23 46.1	15 32 51.79	-19 31 57.5	6.1	2.3	0.16
2	23 18.4	12 7 43.40	2 3 32.6	12.7	4.8	0.32	17	23 48.6	15 39 18.30	20 0 33.7	6.1	2.3	0.16
3	23 12.2	12 5 25.40	1 26 25.3	12.4	4.7	0.31	18	23 51.1	15 45 46.26	20 28 10.7	6.1	2.3	0.16
4	23 6.5	12 3 39.06	0 53 8.0	12.1	4.6	0.30	19	23 53.6	15 52 15.73	20 54 47.0	6.1	2.3	0.16
5	23 1.4	12 2 27.30	0 24 20.5	11.8	4.4	0.30	20	23 56.2	15 58 46.72	21 20 21.3	6.1	2.3	0.17
6	22 56.9	12 1 52.06	- 0 0 33.1	11.5	4.3	0.29	21	23 58.8	16 5 19.27	-21 44 52.3	6.1	2.3	0.17
7	22 53.0	12 1 54.29	+ 0 17 54.7	11.2	4.2	0.28	23	0 1.4	16 11 53.40	22 8 18.4	6.1	2.3	0.17
8	22 49.7	12 2 33.95	0 30 52.4	10.9	4.1	0.27	24	0 4.1	16 18 29.15	22 30 38.2	6.1	2.3	0.17
9	22 47.1	12 3 50.19	0 38 18.4	10.5	4.0	0.26	25	0 6.8	16 25 6.48	22 51 50.3	6.1	2.3	0.17
10	22 45.0	12 5 41.47	0 40 18.3	10.2	3.8	0.26	26	0 9.5	16 31 45.40	23 11 53.3	6.1	2.3	0.17
11	22 43.4	12 8 5.71	+ 0 37 4.2	9.8	3.7	0.25	27	0 12.2	16 38 25.90	-23 30 45.8	6.2	2.3	0.17
12	22 42.3	12 11 0.48	0 28 52.6	9.5	3.6	0.24	28	0 14.9	16 45 7.95	23 48 26.4	6.2	2.3	0.17
13	22 41.8	12 14 23.07	+ 0 16 3.8	9.3	3.5	0.24	29	0 17.7	16 51 51.50	24 4 53.6	6.2	2.3	0.17
14	22 41.7	12 18 10.68	- 0 0 59.9	9.0	3.4	0.23	30	0 20.5	16 58 36.47	24 20 6.0	6.2	2.3	0.17
15	22 41.9	12 22 20.51	0 21 54.3	8.8	3.4	0.22	Dec. 1	0 23.3	17 5 22.80	24 34 2.2	6.3	2.4	0.17
16	22 42.4	12 26 49.85	- 0 46 15.2	8.5	3.3	0.22	2	0 26.1	17 12 10.38	-24 46 40.6	6.3	2.4	0.17
17	22 43.2	12 31 36.14	1 13 38.7	8.3	3.2	0.21	3	0 29.0	17 18 59.09	24 58 0.0	6.3	2.4	0.18
18	22 44.3	12 36 36.99	1 43 41.5	8.1	3.1	0.21	4	0 31.9	17 25 48.79	25 7 59.0	6.4	2.4	0.18
19	22 45.6	12 41 50.26	2 16 1.4	8.0	3.0	0.20	5	0 34.8	17 32 39.31	25 16 36.1	6.4	2.4	0.18
20	22 47.1	12 47 14.03	2 50 18.2	7.8	2.9	0.20	6	0 37.7	17 39 30.46	25 23 49.8	6.5	2.4	0.18
21	22 48.7	12 52 46.62	- 3 26 12.6	7.6	2.9	0.20	7	0 40.6	17 46 22.02	-25 29 39.2	6.5	2.5	0.18
22	22 50.4	12 58 26.53	4 3 27.2	7.5	2.8	0.19	8	0 43.5	17 53 13.72	25 34 2.9	6.6	2.5	0.18
23	22 52.2	13 4 12.52	4 41 46.6	7.4	2.8	0.19	9	0 46.4	18 0 5.29	25 36 59.7	6.6	2.5	0.18
24	22 54.1	13 10 3.54	5 20 56.4	7.2	2.7	0.19	10	0 49.3	18 6 56.40	25 38 28.4	6.7	2.5	0.19
25	22 56.1	13 15 58.67	6 0 44.3	7.1	2.7	0.18	11	0 52.2	18 13 46.68	25 38 28.1	6.7	2.6	0.19
26	22 58.1	13 21 57.17	- 6 40 59.0	7.0	2.7	0.18	12	0 55.0	18 20 35.69	-25 36 58.4	6.8	2.6	0.19
27	23 0.1	13 27 58.46	7 21 30.9	6.9	2.6	0.18	13	0 57.9	18 27 22.95	25 33 58.4	6.9	2.6	0.19
28	23 2.2	13 34 2.03	8 2 11.0	6.8	2.6	0.18	14	1 0.7	18 34 7.92	25 29 27.6	7.0	2.6	0.20
29	23 4.4	13 40 7.48	8 42 51.9	6.8	2.6	0.18	15	1 3.4	18 40 50.01	25 23 26.0	7.0	2.7	0.20
30	23 6.6	13 46 14.51	9 23 26.5	6.7	2.6	0.17	16	1 6.1	18 47 28.53	25 15 53.7	7.1	2.7	0.20
31	23 8.8	13 52 22.89	-10 3 49.0	6.6	2.5	0.17	17	1 8.8	18 54 2.71	-25 6 51.2	7.2	2.7	0.20
Nov. 1	23 11.0	13 58 32.43	10 43 54.2	6.6	2.5	0.17	18	1 11.3	19 0 31.66	24 56 19.6	7.3	2.8	0.21
2	23 13.2	14 4 43.01	11 23 37.0	6.5	2.5	0.17	19	1 13.7	19 6 54.40	24 44 20.3	7.4	2.8	0.21
3	23 15.5	14 10 54.53	12 2 53.4	6.5	2.5	0.17	20	1 16.0	19 13 9.84	24 30 55.3	7.6	2.9	0.21
4	23 17.7	14 17 6.93	12 41 39.9	6.4	2.5	0.17	21	1 18.2	19 19 16.71	24 16 7.4	7.7	2.9	0.22
5	23 20.0	14 23 20.20	-13 19 53.1	6.4	2.4	0.17	22	1 20.2	19 25 13.56	-24 0 0.2	7.8	3.0	0.22
6	23 22.3	14 29 34.35	13 57 30.0	6.3	2.4	0.16	23	1 22.0	19 30 58.79	23 42 38.4	8.0	3.1	0.22
7	23 24.6	14 35 49.39	14 34 27.8	6.3	2.4	0.16	24	1 23.6	19 36 30.62	23 24 7.5	8.2	3.1	0.23
8	23 26.9	14 42 5.35	15 10 44.1	6.3	2.4	0.16	25	1 25.0	19 41 47.03	23 4 34.1	8.4	3.2	0.23
9	23 29.2	14 48 22.26	15 46 16.6	6.2	2.4	0.16	26	1 26.0	19 46 45.77	22 44 6.6	8.6	3.2	0.23
10	23 31.6	14 54 40.16	-16 21 3.3	6.2	2.4	0.16	27	1 26.6	19 51 24.32	-22 22 54.7	8.8	3.3	0.24
11	23 33.9	15 0 59.11	16 55 2.1	6.2	2.3	0.16	28	1 26.9	19 55 39.91	22 1 9.6	9.0	3.4	0.24
12	23 36.3	15 7 19.18	17 28 11.3	6.2	2.3	0.16	29	1 26.8	19 59 29.55	21 39 4.1	9.3	3.5	0.25
13	23 38.7	15 13 40.42	18 0 29.0	6.2	2.3	0.16	30	1 26.2	20 2 50.06	21 16 52.9	9.5	3.6	0.25
14	23 41.1	15 20 2.89	18 31 53.6	6.1	2.3	0.16	31	1 25.1	20 5 38.05	20 54 52.1	9.7	3.7	0.26
15	23 43.6	15 26 26.66	-19 2 23.6	6.1	2.3	0.16	32	1 23.4	20 7 50.05	-20 33 19.5	10.0	3.8	0.27
16	23 46.1	15 32 51.79	-19 31 57.5	6.1	2.3	0.16	33	1 21.0	20 9 22.64	-20 12 33.6	10.4	3.9	0.28

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	"		h m	h m s	° ' "	"	"	"
Jan. 0	23 14.0	17 59 7.96	-23 24 50.7	5.3	5.1	0.37	Feb. 16	0 14.5	22 1 8.12	-13 35 26.5	5.2	5.0	0.34
1	23 15.6	18 4 37.13	23 27 3.9	5.3	5.1	0.37	17	0 15.4	22 5 58.92	13 9 58.0	5.2	5.0	0.34
2	23 17.2	18 10 6.44	23 28 33.6	5.3	5.1	0.37	18	0 16.3	22 10 48.63	12 44 8.2	5.2	5.0	0.34
3	23 18.7	18 15 35.85	23 29 19.6	5.3	5.1	0.37	19	0 17.2	22 15 37.27	12 17 57.8	5.2	5.0	0.34
4	23 20.3	18 21 5.27	23 29 21.9	5.3	5.1	0.37	20	0 18.1	22 20 24.86	11 51 27.7	5.2	5.0	0.34
5	23 21.8	18 26 34.67	-23 28 40.6	5.3	5.1	0.37	21	0 18.9	22 25 11.41	-11 24 38.5	5.2	5.0	0.34
6	23 23.3	18 32 3.98	23 27 15.6	5.3	5.1	0.37	22	0 19.7	22 29 56.95	10 57 31.1	5.2	5.0	0.34
7	23 24.8	18 37 33.14	23 25 6.9	5.3	5.1	0.37	23	0 20.5	22 34 41.50	10 30 6.2	5.2	5.0	0.34
8	23 26.4	18 43 2.07	23 22 14.6	5.3	5.1	0.37	24	0 21.3	22 39 25.12	10 2 24.7	5.2	5.0	0.34
9	23 27.9	18 48 30.74	23 18 38.8	5.3	5.1	0.37	25	0 22.1	22 44 7.84	9 34 27.3	5.2	5.0	0.34
10	23 29.4	18 53 59.08	-23 14 19.6	5.3	5.1	0.37	26	0 22.9	22 48 49.66	-9 6 14.8	5.2	5.0	0.34
11	23 30.9	18 59 27.03	23 9 17.2	5.3	5.1	0.37	27	0 23.6	22 53 30.63	8 37 48.0	5.2	5.0	0.34
12	23 32.4	19 4 54.52	23 3 31.9	5.3	5.1	0.37	28	0 24.3	22 58 10.78	8 9 7.6	5.2	5.0	0.34
13	23 33.9	19 10 21.51	22 57 3.9	5.2	5.1	0.37	Mar. 1	0 25.0	23 2 50.14	7 40 14.3	5.2	5.0	0.34
14	23 35.4	19 15 47.94	22 49 53.4	5.2	5.1	0.37	2	0 25.6	23 7 28.77	7 11 9.0	5.2	5.0	0.34
15	23 36.9	19 21 13.75	-22 42 0.6	5.2	5.1	0.37	3	0 26.3	23 12 6.69	-6 41 52.4	5.2	5.0	0.33
16	23 38.4	19 26 38.89	22 33 26.0	5.2	5.1	0.37	4	0 27.0	23 16 43.95	6 12 25.2	5.2	5.0	0.33
17	23 39.9	19 32 3.29	22 24 9.9	5.2	5.1	0.36	5	0 27.6	23 21 20.58	5 42 48.2	5.2	5.0	0.33
18	23 41.4	19 37 26.92	22 14 12.7	5.2	5.1	0.36	6	0 28.3	23 25 56.63	5 13 2.1	5.2	5.0	0.33
19	23 42.8	19 42 49.72	22 3 34.8	5.2	5.0	0.36	7	0 28.9	23 30 32.15	4 43 7.6	5.2	5.0	0.33
20	23 44.2	19 48 11.63	-21 52 16.7	5.2	5.0	0.36	8	0 29.6	23 35 7.17	-4 13 5.5	5.2	5.0	0.33
21	23 45.6	19 53 32.63	21 40 18.8	5.2	5.0	0.36	9	0 30.2	23 39 41.73	3 42 56.5	5.2	5.0	0.33
22	23 47.0	19 58 52.68	21 27 41.7	5.2	5.0	0.36	10	0 30.9	23 44 15.88	3 12 41.3	5.2	5.0	0.33
23	23 48.4	20 4 11.73	21 14 25.8	5.2	5.0	0.36	11	0 31.5	23 48 49.66	2 42 20.7	5.2	5.0	0.33
24	23 49.8	20 9 29.74	21 0 31.8	5.2	5.0	0.36	12	0 32.1	23 53 23.12	2 11 55.4	5.2	5.0	0.33
25	23 51.1	20 14 46.68	-20 46 0.1	5.2	5.0	0.36	13	0 32.7	23 57 56.29	-1 41 26.1	5.2	5.0	0.33
26	23 52.4	20 20 2.53	20 30 51.3	5.2	5.0	0.36	14	0 33.3	0 2 29.21	1 10 53.5	5.2	5.0	0.33
27	23 53.7	20 25 17.25	20 15 6.2	5.2	5.0	0.36	15	0 33.9	0 7 1.94	0 40 18.4	5.2	5.0	0.33
28	23 55.0	20 30 30.81	19 58 45.3	5.2	5.0	0.36	16	0 34.5	0 11 34.51	-0 9 41.5	5.2	5.0	0.33
29	23 56.2	20 35 43.19	19 41 49.2	5.2	5.0	0.36	17	0 35.1	0 16 6.97	-0 20 56.5	5.2	5.0	0.33
30	23 57.5	20 40 54.39	-19 24 18.6	5.2	5.0	0.35	18	0 35.7	0 20 39.36	+0 51 34.9	5.2	5.0	0.33
31	23 58.7	20 46 4.39	19 6 14.2	5.2	5.0	0.35	19	0 36.3	0 25 11.72	1 22 12.8	5.2	5.0	0.33
Feb. 1	23 59.8	20 51 13.17	18 47 36.6	5.2	5.0	0.35	20	0 36.9	0 29 44.09	1 52 49.5	5.2	5.0	0.33
3	0 1.0	20 56 20.73	18 28 26.6	5.2	5.0	0.35	21	0 37.5	0 34 16.52	2 23 24.3	5.2	5.0	0.34
4	0 2.2	21 1 27.06	18 8 44.8	5.2	5.0	0.35	22	0 38.1	0 38 49.02	2 53 56.5	5.2	5.0	0.34
5	0 3.3	21 6 32.16	-17 48 31.8	5.2	5.0	0.35	23	0 38.7	0 43 21.64	+3 24 25.3	5.2	5.0	0.34
6	0 4.4	21 11 36.02	17 27 48.4	5.2	5.0	0.35	24	0 39.3	0 47 54.45	3 54 50.0	5.2	5.0	0.34
7	0 5.5	21 16 38.65	17 6 35.5	5.2	5.0	0.35	25	0 39.9	0 52 27.47	4 25 9.8	5.2	5.0	0.34
8	0 6.6	21 21 40.05	16 44 53.6	5.2	5.0	0.35	26	0 40.5	0 57 0.76	4 55 23.9	5.2	5.0	0.34
9	0 7.7	21 26 40.23	16 22 43.5	5.2	5.0	0.35	27	0 41.1	1 1 34.33	5 25 31.7	5.2	5.0	0.34
10	0 8.7	21 31 39.20	-16 0 6.0	5.2	5.0	0.35	28	0 41.7	1 6 8.24	+5 55 32.4	5.2	5.1	0.34
11	0 9.7	21 36 36.96	15 37 1.8	5.2	5.0	0.35	29	0 42.4	1 10 42.51	6 25 25.3	5.2	5.1	0.34
12	0 10.7	21 41 33.53	15 13 31.6	5.2	5.0	0.34	30	0 43.0	1 15 17.20	6 55 9.6	5.2	5.1	0.34
13	0 11.6	21 46 28.92	14 49 36.2	5.2	5.0	0.34	31	0 43.7	1 19 52.34	7 24 44.7	5.3	5.1	0.34
14	0 12.6	21 51 23.14	14 25 16.4	5.2	5.0	0.34	32	0 44.3	1 24 27.98	7 54 9.8	5.3	5.1	0.34
15	0 13.5	21 56 16.20	-14 0 32.9	5.2	5.0	0.34	33	0 45.0	1 29 4.15	+8 23 24.1	5.3	5.1	0.34
16	0 14.5	22 1 8.12	-13 35 26.5	5.2	5.0	0.34	34	0 45.7	1 33 40.89	+8 52 26.8	5.3	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	0 44.3	1 24 27.98	+ 7 54 9.8	5.3	5.1	0.34	May 17	1 30.2	5 11 52.39	+23 54 54.4	5.7	5.5	0.40
2	0 45.0	1 29 4.15	8 23 24.1	5.3	5.1	0.34	18	1 31.6	5 17 10.72	24 2 57.3	5.7	5.6	0.41
3	0 45.7	1 33 40.89	8 52 26.8	5.3	5.1	0.34	19	1 32.9	5 22 29.55	24 10 18.7	5.8	5.6	0.41
4	0 46.4	1 38 18.24	9 21 17.2	5.3	5.1	0.34	20	1 34.3	5 27 48.84	24 16 58.0	5.8	5.6	0.41
5	0 47.1	1 42 56.24	9 49 54.7	5.3	5.1	0.34	21	1 35.7	5 33 8.51	24 22 55.1	5.8	5.6	0.41
6	0 47.8	1 47 34.93	+10 18 18.5	5.3	5.1	0.35	22	1 37.1	5 38 28.51	+24 28 9.7	5.8	5.6	0.41
7	0 48.5	1 52 14.35	10 46 27.9	5.3	5.1	0.35	23	1 38.5	5 43 48.78	24 32 41.7	5.8	5.6	0.41
8	0 49.2	1 56 54.52	11 14 22.1	5.3	5.1	0.35	24	1 39.9	5 49 9.25	24 36 30.8	5.8	5.6	0.41
9	0 49.9	2 1 35.49	11 42 0.4	5.3	5.1	0.35	25	1 41.3	5 54 29.65	24 39 36.9	5.9	5.7	0.42
10	0 50.7	2 6 17.29	12 9 22.0	5.3	5.1	0.35	26	1 42.7	5 59 50.53	24 41 59.8	5.9	5.7	0.42
11	0 51.4	2 10 59.94	+12 36 26.2	5.3	5.1	0.35	27	1 44.1	6 5 11.23	+24 43 39.4	5.9	5.7	0.42
12	0 52.2	2 15 43.48	13 3 12.3	5.3	5.1	0.35	28	1 45.5	6 10 31.88	24 44 35.8	5.9	5.7	0.42
13	0 53.0	2 20 27.94	13 29 39.5	5.3	5.2	0.35	29	1 46.9	6 15 52.41	24 44 48.7	5.9	5.7	0.42
14	0 53.8	2 25 13.33	13 55 47.1	5.3	5.2	0.35	30	1 48.3	6 21 12.74	24 44 18.3	6.0	5.7	0.42
15	0 54.6	2 29 59.68	14 21 34.3	5.3	5.2	0.36	31	1 49.7	6 26 32.82	24 43 4.6	6.0	5.8	0.42
16	0 55.5	2 34 47.02	+14 47 0.3	5.4	5.2	0.36	June 1	1 51.1	6 31 52.59	+24 41 7.8	6.0	5.8	0.43
17	0 56.3	2 39 35.37	15 12 4.5	5.4	5.2	0.36	2	1 52.5	6 37 12.00	24 38 27.9	6.0	5.8	0.43
18	0 57.2	2 44 24.74	15 36 46.0	5.4	5.2	0.36	3	1 53.8	6 42 30.96	24 35 5.0	6.1	5.8	0.43
19	0 58.1	2 49 15.17	16 1 4.1	5.4	5.2	0.36	4	1 55.2	6 47 49.43	24 30 59.3	6.1	5.8	0.43
20	0 59.0	2 54 6.65	16 24 57.9	5.4	5.2	0.36	5	1 56.5	6 53 7.36	24 26 11.0	6.1	5.8	0.43
21	0 59.9	2 58 59.20	+16 48 26.9	5.4	5.2	0.36	6	1 57.9	6 58 24.68	+24 20 40.3	6.1	5.9	0.43
22	1 0.9	3 3 52.84	17 11 30.2	5.4	5.2	0.36	7	1 59.2	7 3 41.34	24 14 27.5	6.1	5.9	0.43
23	1 1.8	3 8 47.66	17 34 7.0	5.4	5.2	0.37	8	2 0.5	7 8 57.28	24 7 32.8	6.2	5.9	0.43
24	1 2.8	3 13 43.38	17 56 16.5	5.4	5.2	0.37	9	2 1.8	7 14 12.45	23 59 56.7	6.2	6.0	0.43
25	1 3.8	3 18 40.30	18 17 58.1	5.4	5.3	0.37	10	2 3.1	7 19 26.80	23 51 39.3	6.2	6.0	0.44
26	1 4.8	3 23 38.31	+18 39 11.2	5.5	5.3	0.37	11	2 4.4	7 24 40.28	+23 42 41.2	6.2	6.0	0.44
27	1 5.8	3 28 37.42	18 59 54.9	5.5	5.3	0.37	12	2 5.6	7 29 52.84	23 33 9.7	6.2	6.0	0.44
28	1 6.9	3 33 37.64	19 20 8.5	5.5	5.3	0.37	13	2 6.8	7 35 4.42	23 22 44.3	6.3	6.1	0.44
29	1 8.0	3 38 38.96	19 39 51.2	5.5	5.3	0.37	14	2 8.0	7 40 14.97	23 11 46.4	6.3	6.1	0.44
30	1 9.1	3 43 41.37	19 59 2.5	5.5	5.3	0.38	15	2 9.2	7 45 24.46	23 0 9.3	6.3	6.1	0.44
May 1	1 10.2	3 48 44.86	+20 17 41.6	5.5	5.3	0.38	16	2 10.4	7 50 32.85	+22 47 53.5	6.4	6.1	0.44
2	1 11.3	3 53 49.42	20 35 47.8	5.5	5.3	0.38	17	2 11.6	7 55 40.10	22 34 59.6	6.4	6.2	0.44
3	1 12.4	3 58 55.05	20 53 20.5	5.5	5.4	0.38	18	2 12.8	8 0 46.16	22 21 28.1	6.4	6.2	0.45
4	1 13.6	4 4 1.73	21 10 19.2	5.5	5.4	0.38	19	2 13.9	8 5 50.99	22 7 19.7	6.4	6.2	0.45
5	1 14.8	4 9 9.43	21 26 43.2	5.6	5.4	0.38	20	2 15.0	8 10 54.57	21 52 34.8	6.4	6.2	0.45
6	1 16.0	4 14 18.14	+21 42 31.8	5.6	5.4	0.39	21	2 16.1	8 15 56.86	+21 37 14.0	6.5	6.3	0.45
7	1 17.2	4 19 27.84	21 57 44.4	5.6	5.4	0.39	22	2 17.2	8 20 57.83	21 21 18.1	6.5	6.3	0.45
8	1 18.4	4 24 38.50	22 12 20.4	5.6	5.4	0.39	23	2 18.3	8 25 57.46	21 4 47.4	6.5	6.3	0.45
9	1 19.7	4 29 50.10	22 26 19.3	5.6	5.4	0.39	24	2 19.4	8 30 55.72	20 47 42.7	6.6	6.3	0.45
10	1 21.0	4 35 2.61	22 39 40.6	5.6	5.4	0.39	25	2 20.4	8 35 52.59	20 30 4.6	6.6	6.4	0.45
11	1 22.3	4 40 16.00	+22 52 23.7	5.6	5.4	0.39	26	2 21.4	8 40 48.06	+20 11 53.8	6.6	6.4	0.46
12	1 23.6	4 45 30.23	23 4 28.2	5.6	5.5	0.40	27	2 22.4	8 45 42.09	19 53 11.2	6.7	6.4	0.46
13	1 24.9	4 50 45.24	23 15 53.6	5.7	5.5	0.40	28	2 23.3	8 50 34.69	19 33 57.4	6.7	6.5	0.46
14	1 26.2	4 56 1.01	23 26 39.3	5.7	5.5	0.40	29	2 24.2	8 55 25.84	19 14 12.8	6.7	6.5	0.46
15	1 27.5	5 1 17.48	23 36 45.0	5.7	5.5	0.40	30	2 25.1	9 0 15.54	18 53 58.3	6.8	6.5	0.46
16	1 28.9	5 6 34.63	+23 46 10.2	5.7	5.5	0.40	31	2 26.9	9 5 3.80	+18 33 14.5	6.8	6.6	0.46
17	1 30.2	5 11 52.39	+23 54 54.4	5.7	5.5	0.40	32	2 26.7	9 9 50.61	+18 12 2.1	6.8	6.6	0.46

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	2 25.9	9 5 3.80	+18 33 14.5	6.8	6.6	0.46	Aug. 16	2 43.7	12 24 22.78	-2 45 6.4	9.1	8.8	0.59
2	2 26.7	9 9 50.61	18 12 2.1	6.8	6.6	0.46	17	2 43.8	12 28 24.04	3 15 42.0	9.2	8.8	0.59
3	2 27.5	9 14 35.97	17 50 21.9	6.9	6.6	0.46	18	2 43.9	12 32 24.97	3 46 14.4	9.2	8.9	0.60
4	2 28.3	9 19 19.89	17 28 14.6	6.9	6.7	0.47	19	2 44.0	12 36 25.57	4 16 43.1	9.3	9.0	0.60
5	2 29.1	9 24 2.38	17 5 40.7	6.9	6.7	0.47	20	2 44.0	12 40 25.88	4 47 7.2	9.4	9.1	0.61
6	2 29.8	9 28 43.43	+16 42 41.1	7.0	6.7	0.47	21	2 44.1	12 44 25.91	5 17 26.3	9.5	9.1	0.61
7	2 30.5	9 33 23.06	16 19 16.5	7.0	6.8	0.47	22	2 44.1	12 48 25.68	5 47 39.7	9.6	9.2	0.62
8	2 31.2	9 38 1.29	15 55 27.4	7.1	6.8	0.47	23	2 44.2	12 52 25.19	6 17 46.8	9.6	9.3	0.62
9	2 31.9	9 42 38.12	15 31 14.9	7.1	6.8	0.47	24	2 44.2	12 56 24.49	6 47 46.9	9.7	9.4	0.63
10	2 32.5	9 47 13.57	15 6 39.4	7.1	6.9	0.47	25	2 44.3	13 0 23.58	7 17 39.3	9.8	9.5	0.64
11	2 33.1	9 51 47.65	+14 41 41.7	7.2	6.9	0.48	26	2 44.3	13 4 22.48	7 47 23.5	9.9	9.5	0.64
12	2 33.7	9 56 20.39	14 16 22.5	7.2	7.0	0.48	27	2 44.3	13 8 21.20	8 16 58.9	10.0	9.6	0.65
13	2 34.3	10 0 51.81	13 50 42.5	7.3	7.0	0.48	28	2 44.4	13 12 19.75	8 46 24.7	10.0	9.7	0.65
14	2 34.9	10 5 21.92	13 24 42.4	7.3	7.0	0.48	29	2 44.4	13 16 18.15	9 15 40.3	10.1	9.8	0.66
15	2 35.4	10 9 50.74	12 58 22.9	7.3	7.1	0.48	30	2 44.4	13 20 16.42	9 44 45.3	10.2	9.9	0.67
16	2 35.9	10 14 18.29	+12 31 44.7	7.4	7.1	0.49	31	2 44.4	13 24 14.57	-10 13 39.0	10.3	10.0	0.68
17	2 36.4	10 18 44.60	12 4 48.6	7.4	7.2	0.49	Sept. 1	2 44.4	13 28 12.62	10 42 20.9	10.4	10.1	0.68
18	2 36.9	10 23 9.67	11 37 35.3	7.5	7.2	0.49	2	2 44.5	13 32 10.56	11 10 50.4	10.5	10.2	0.69
19	2 37.4	10 27 33.54	11 10 5.5	7.5	7.3	0.49	3	2 44.5	13 36 8.43	11 39 6.9	10.6	10.2	0.70
20	2 37.9	10 31 56.22	10 42 19.9	7.5	7.3	0.49	4	2 44.5	13 40 6.23	12 7 9.8	10.7	10.3	0.71
21	2 38.3	10 36 17.75	+10 14 19.2	7.6	7.3	0.50	5	2 44.5	13 44 3.96	-12 34 58.5	10.8	10.4	0.71
22	2 38.7	10 40 38.13	9 46 4.1	7.6	7.4	0.50	6	2 44.5	13 48 1.62	13 2 32.4	10.9	10.5	0.72
23	2 39.1	10 44 57.39	9 17 35.3	7.7	7.4	0.50	7	2 44.5	13 51 59.23	13 29 51.1	11.0	10.6	0.73
24	2 39.5	10 49 15.56	8 48 53.6	7.7	7.5	0.50	8	2 44.5	13 55 56.78	13 56 53.9	11.1	10.7	0.74
25	2 39.8	10 53 32.67	8 19 59.6	7.8	7.5	0.51	9	2 44.6	13 59 54.26	14 23 40.4	11.2	10.8	0.75
26	2 40.1	10 57 48.75	+7 50 54.1	7.8	7.6	0.51	10	2 44.6	14 3 51.67	-14 50 9.8	11.3	11.0	0.76
27	2 40.4	11 2 3.82	7 21 37.7	7.9	7.6	0.51	11	2 44.6	14 7 49.00	15 16 21.8	11.5	11.1	0.76
28	2 40.7	11 6 17.91	6 52 11.1	7.9	7.7	0.52	12	2 44.6	14 11 46.24	15 42 15.6	11.6	11.2	0.77
29	2 40.9	11 10 31.06	6 22 35.0	8.0	7.7	0.52	13	2 44.6	14 15 43.37	16 7 50.7	11.7	11.3	0.78
30	2 41.1	11 14 43.27	5 52 50.1	8.0	7.8	0.52	14	2 44.7	14 19 40.37	16 33 6.6	11.8	11.4	0.79
31	2 41.3	11 18 54.61	+5 22 57.0	8.1	7.8	0.52	15	2 44.7	14 23 37.21	-16 58 2.6	11.9	11.5	0.80
Aug. 1	2 41.6	11 23 5.11	4 52 56.3	8.2	7.9	0.53	16	2 44.7	14 27 33.86	17 22 38.2	12.1	11.6	0.81
2	2 41.8	11 27 14.79	4 22 48.8	8.2	7.9	0.53	17	2 44.7	14 31 30.29	17 46 52.6	12.2	11.8	0.82
3	2 42.0	11 31 23.68	3 52 35.1	8.3	8.0	0.53	18	2 44.7	14 35 26.45	18 10 45.5	12.3	11.9	0.83
4	2 42.2	11 35 31.81	3 22 15.8	8.3	8.0	0.54	19	2 44.7	14 39 22.30	18 34 16.4	12.4	12.0	0.85
5	2 42.4	11 39 39.23	+2 51 51.5	8.4	8.1	0.54	20	2 44.7	14 43 17.80	-18 57 24.6	12.6	12.2	0.86
6	2 42.6	11 43 45.96	2 21 23.0	8.4	8.1	0.54	21	2 44.8	14 47 12.90	19 20 9.6	12.7	12.3	0.87
7	2 42.8	11 47 52.04	1 50 50.7	8.5	8.2	0.55	22	2 44.8	14 51 7.55	19 42 30.8	12.9	12.4	0.88
8	2 42.9	11 51 57.50	1 20 15.2	8.6	8.2	0.55	23	2 44.8	14 55 1.71	20 4 27.6	13.0	12.6	0.89
9	2 43.0	11 56 2.39	0 49 37.3	8.6	8.3	0.55	24	2 44.5	14 58 55.30	20 25 59.6	13.2	12.7	0.91
10	2 43.1	12 0 6.73	+0 18 57.5	8.7	8.4	0.56	25	2 44.5	15 2 48.26	-20 47 6.2	13.3	12.9	0.93
11	2 43.2	12 4 10.55	-0 11 43.7	8.8	8.4	0.56	26	2 44.4	15 6 40.52	21 7 46.9	13.5	13.0	0.93
12	2 43.3	12 8 13.88	0 42 25.5	8.8	8.5	0.57	27	2 44.4	15 10 32.02	21 28 1.3	13.6	13.2	0.94
13	2 43.4	12 12 16.74	1 13 7.3	8.9	8.6	0.57	28	2 44.3	15 14 22.68	21 47 48.9	13.8	13.3	0.96
14	2 43.5	12 16 19.16	1 43 48.5	8.9	8.6	0.58	29	2 44.2	15 18 12.44	22 7 9.3	14.0	13.5	0.97
15	2 43.6	12 20 21.16	-2 14 28.4	9.0	8.7	0.58	30	2 44.1	15 22 1.91	-22 26 2.0	14.2	13.7	0.99
16	2 43.7	12 24 22.78	-2 45 6.4	9.1	8.8	0.59	31	2 43.9	15 25 48.90	-22 44 27.0	14.3	13.9	1.00

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	2 43.9	15 25 48.90	-22 44 27.0	14.3	13.9	1.00	Nov. 16	1 29.8	17 12 46.06	-27 13 16.9	28.8	27.9	2.08
2	2 43.7	15 29 35.43	23 2 23.7	14.5	14.0	1.02	17	1 25.2	17 12 10.05	27 4 33.5	29.3	28.3	2.11
3	2 43.5	15 33 20.69	23 19 51.7	14.7	14.2	1.03	18	1 20.4	17 11 23.41	26 55 2.5	29.7	28.7	2.13
4	2 43.3	15 37 4.60	23 36 50.8	14.9	14.4	1.05	19	1 15.5	17 10 26.26	26 44 43.2	30.1	29.0	2.16
5	2 43.1	15 40 47.03	23 53 20.4	15.1	14.6	1.06	20	1 10.5	17 9 18.78	26 33 34.9	30.5	29.4	2.18
6	2 42.8	15 44 27.89	-24 9 20.4	15.3	14.8	1.08	21	1 5.3	17 8 1.21	-26 21 37.1	30.8	29.8	2.21
7	2 42.5	15 48 7.07	24 24 50.5	15.5	15.0	1.09	22	0 59.9	17 6 33.91	26 8 49.6	31.2	30.1	2.23
8	2 42.2	15 51 44.42	24 39 50.5	15.7	15.2	1.11	23	0 54.4	17 4 57.35	25 55 12.4	31.5	30.4	2.25
9	2 41.8	15 55 19.83	24 54 20.0	15.9	15.4	1.13	24	0 48.7	17 3 12.04	25 40 46.2	31.8	30.7	2.26
10	2 41.4	15 58 53.14	25 8 18.8	16.1	15.6	1.15	25	0 42.9	17 1 18.61	25 25 32.2	32.1	31.0	2.28
11	2 41.0	16 2 24.20	-25 21 46.7	16.3	15.8	1.16	26	0 37.0	16 59 17.74	-25 9 31.9	32.4	31.3	2.29
12	2 40.5	16 5 52.86	25 34 43.4	16.6	16.0	1.18	27	0 31.0	16 57 10.22	24 52 47.1	32.6	31.5	2.30
13	2 40.0	16 9 18.94	25 47 8.8	16.8	16.3	1.20	28	0 24.8	16 54 56.91	24 35 20.4	32.8	31.7	2.31
14	2 39.5	16 12 42.28	25 59 2.6	17.1	16.5	1.22	29	0 18.5	16 52 38.73	24 17 15.0	33.0	31.9	2.32
15	2 38.9	16 16 2.67	26 10 24.7	17.3	16.8	1.24	30	0 12.2	16 50 16.65	23 58 34.6	33.2	32.0	2.33
16	2 38.3	16 19 19.94	-26 21 14.8	17.6	17.0	1.26	Dec. 1	0 5.9	16 47 51.72	-23 39 23.5	33.3	32.1	2.33
17	2 37.5	16 22 33.87	26 31 32.6	17.8	17.2	1.28	1	23 59.5	16 45 24.98	23 19 46.4	33.4	32.2	2.34
18	2 36.7	16 25 44.25	26 41 18.0	18.1	17.5	1.30	2	23 53.1	16 42 57.46	22 59 48.7	33.5	32.2	2.34
19	2 35.9	16 28 50.87	26 50 30.9	18.4	17.8	1.32	3	23 46.7	16 40 30.24	22 39 35.9	33.5	32.3	2.33
20	2 35.0	16 31 53.49	26 59 11.1	18.7	18.0	1.35	4	23 40.4	16 38 4.39	22 19 14.0	33.4	32.2	2.33
21	2 34.0	16 34 51.88	-27 7 18.5	19.0	18.3	1.37	5	23 34.1	16 35 40.91	-21 58 49.0	33.3	32.2	2.32
22	2 33.0	16 37 45.78	27 14 53.0	19.3	18.6	1.39	6	23 27.9	16 33 20.77	21 38 27.1	33.2	32.1	2.31
23	2 31.9	16 40 34.95	27 21 54.3	19.5	18.9	1.42	7	23 21.8	16 31 4.89	21 18 14.6	33.0	32.0	2.30
24	2 30.6	16 43 19.14	27 28 22.3	19.8	19.2	1.44	8	23 15.7	16 28 54.14	20 58 17.8	32.8	31.9	2.28
25	2 29.3	16 45 58.07	27 34 16.8	20.2	19.5	1.47	9	23 9.6	16 26 49.30	20 38 42.6	32.6	31.6	2.26
26	2 28.0	16 48 31.50	-27 39 37.7	20.5	19.8	1.49	10	23 3.7	16 24 51.10	-20 19 34.6	32.4	31.4	2.23
27	2 26.6	16 50 59.13	27 44 24.9	20.9	20.1	1.52	11	22 57.9	16 23 0.18	20 0 59.0	32.2	31.1	2.20
28	2 25.0	16 53 20.70	27 48 38.2	21.2	20.4	1.54	12	22 52.3	16 21 17.11	19 43 0.6	31.9	30.8	2.18
29	2 23.3	16 55 35.91	27 52 17.5	21.6	20.8	1.57	13	22 46.7	16 19 42.38	19 25 44.0	31.6	30.5	2.15
30	2 21.5	16 57 44.51	27 55 22.4	21.9	21.2	1.60	14	22 41.3	16 18 16.39	19 9 13.2	31.3	30.2	2.13
31	2 19.6	16 59 46.19	-27 57 52.7	22.3	21.5	1.62	15	22 36.1	16 16 59.49	-18 53 31.7	30.9	29.9	2.10
Nov. 1	2 17.6	17 1 40.69	27 59 48.2	22.6	21.9	1.65	16	22 31.0	16 15 51.95	18 38 42.1	30.6	29.5	2.07
2	2 15.5	17 3 27.71	28 1 8.7	23.0	22.2	1.68	17	22 26.1	16 14 54.00	18 24 46.9	30.2	29.2	2.04
3	2 13.1	17 5 6.95	28 1 53.7	23.4	22.6	1.71	18	22 21.4	16 14 5.77	18 11 47.9	29.8	28.8	2.01
4	2 10.7	17 6 38.12	28 2 2.8	23.8	23.0	1.74	19	22 16.9	16 13 27.32	17 59 46.5	29.4	28.4	1.98
5	2 8.2	17 8 0.94	-28 1 35.7	24.2	23.3	1.77	20	22 12.5	16 12 58.72	-17 48 43.6	29.0	28.0	1.95
6	2 5.4	17 9 15.12	28 0 31.6	24.6	23.7	1.80	21	22 8.3	16 12 39.97	17 38 39.5	28.5	27.5	1.92
7	2 2.6	17 10 20.37	27 58 49.9	25.0	24.1	1.82	22	22 4.2	16 12 31.00	17 29 34.3	28.1	27.1	1.89
8	1 59.7	17 11 16.42	27 56 30.2	25.4	24.5	1.85	23	22 0.2	16 12 31.75	17 21 27.5	27.6	26.7	1.86
9	1 56.6	17 12 3.02	27 53 31.6	25.8	24.9	1.88	24	21 56.4	16 12 42.09	17 14 18.4	27.2	26.3	1.83
10	1 53.2	17 12 39.89	-27 49 53.3	26.3	25.3	1.91	25	21 52.8	16 13 1.94	-17 8 5.9	26.7	25.9	1.80
11	1 49.7	17 13 6.82	27 45 34.4	26.7	25.8	1.94	26	21 49.3	16 13 31.05	17 2 48.9	26.3	25.4	1.77
12	1 46.0	17 13 23.61	27 40 34.0	27.1	26.2	1.97	27	21 46.1	16 14 9.27	16 58 25.5	25.9	25.0	1.74
13	1 42.2	17 13 30.07	27 34 51.3	27.5	26.6	2.00	28	21 43.0	16 14 56.39	16 54 54.5	25.4	24.6	1.72
14	1 38.3	17 13 26.03	27 28 24.9	28.0	27.0	2.03	29	21 40.0	16 15 52.21	16 52 13.5	25.0	24.2	1.68
15	1 34.2	17 13 11.38	-27 21 13.7	28.4	27.4	2.06	30	21 37.1	16 16 56.48	-16 50 20.7	24.6	23.8	1.66
16	1 29.8	17 12 46.06	-27 13 16.9	28.8	27.9	2.08	31	21 34.4	16 18 8.98	-16 49 13.8	24.2	23.4	1.63

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 1	19 8.5	13 56 52.37	-10 25 28.7	5.2	3.0	0.90	Feb. 15	17 43.5	15 29 1.63	-17 36 12.3	7.2	4.1	0.28
2	19 6.7	13 59 0.44	10 37 9.4	5.3	3.0	0.20	16	17 41.5	15 30 55.21	17 43 23.2	7.2	4.1	0.29
3	19 4.9	14 1 8.39	10 48 45.0	5.3	3.0	0.30	17	17 39.4	15 32 48.14	17 50 27.7	7.3	4.2	0.29
4	19 3.1	14 3 16.21	11 0 15.6	5.3	3.1	0.21	18	17 37.3	15 34 40.37	17 57 25.7	7.3	4.2	0.29
5	19 1.3	14 5 23.90	11 11 41.1	5.4	3.1	0.21	19	17 35.3	15 36 31.90	18 4 17.3	7.4	4.3	0.30
6	18 59.5	14 7 31.45	11 23 1.4	5.4	3.1	0.21	20	17 33.2	15 38 22.70	18 11 2.5	7.5	4.3	0.30
7	18 57.7	14 9 38.87	11 34 16.5	5.4	3.1	0.21	21	17 31.1	15 40 12.75	18 17 41.2	7.5	4.3	0.30
8	18 55.9	14 11 46.13	11 45 26.3	5.5	3.1	0.21	22	17 29.0	15 42 2.03	18 24 13.6	7.6	4.4	0.31
9	18 54.0	14 13 53.25	11 56 30.7	5.5	3.2	0.21	23	17 26.8	15 43 50.51	18 30 39.8	7.7	4.4	0.31
10	18 52.2	14 16 0.21	12 7 29.8	5.5	3.2	0.22	24	17 24.7	15 45 38.18	18 36 59.6	7.7	4.5	0.31
11	18 50.4	14 18 7.01	12 18 23.4	5.6	3.2	0.22	25	17 22.5	15 47 25.01	18 43 13.3	7.8	4.5	0.32
12	18 48.6	14 20 13.62	12 29 11.5	5.6	3.2	0.22	26	17 20.3	15 49 10.99	18 49 20.8	7.9	4.5	0.32
13	18 46.7	14 22 20.06	12 39 53.9	5.6	3.2	0.22	27	17 18.2	15 50 56.09	18 55 22.2	7.9	4.6	0.32
14	18 44.9	14 24 26.30	12 50 30.7	5.7	3.3	0.22	28	17 16.0	15 52 40.29	19 1 17.6	8.0	4.6	0.32
15	18 43.1	14 26 32.34	13 1 1.8	5.7	3.3	0.22	Mar. 1	17 13.8	15 54 23.56	19 7 7.0	8.1	4.7	0.33
16	18 41.2	14 28 38.16	13 11 27.0	5.7	3.3	0.22	2	17 11.5	15 56 5.88	19 12 50.5	8.2	4.7	0.33
17	18 39.4	14 30 43.76	13 21 46.4	5.8	3.3	0.23	3	17 9.3	15 57 47.23	19 18 28.2	8.2	4.7	0.33
18	18 37.5	14 32 49.12	13 31 59.9	5.8	3.3	0.23	4	17 7.0	15 59 27.58	19 24 0.1	8.3	4.8	0.34
19	18 35.7	14 34 54.23	13 42 7.4	5.8	3.4	0.23	5	17 4.7	16 1 6.89	19 29 26.3	8.4	4.8	0.34
20	18 33.8	14 36 59.09	13 52 8.9	5.9	3.4	0.23	6	17 2.4	16 2 45.14	19 34 46.8	8.5	4.9	0.34
21	18 32.0	14 39 3.68	14 2 4.3	5.9	3.4	0.23	7	17 0.1	16 4 22.31	19 40 1.7	8.6	4.9	0.34
22	18 30.1	14 41 7.99	14 11 53.5	5.9	3.4	0.23	8	16 57.8	16 5 58.35	19 45 11.1	8.6	4.9	0.35
23	18 28.2	14 43 12.02	14 21 36.6	6.0	3.4	0.24	9	16 55.4	16 7 33.22	19 50 15.0	8.7	5.0	0.35
24	18 26.4	14 45 15.76	14 31 13.6	6.0	3.5	0.24	10	16 53.0	16 9 6.89	19 55 13.5	8.8	5.0	0.35
25	18 24.5	14 47 19.19	14 40 44.3	6.1	3.5	0.24	11	16 50.6	16 10 39.32	20 0 6.6	8.9	5.1	0.36
26	18 22.6	14 49 22.31	14 50 8.8	6.2	3.5	0.24	12	16 48.2	16 12 10.48	20 4 54.4	9.0	5.1	0.36
27	18 20.7	14 51 25.10	14 59 27.1	6.2	3.5	0.24	13	16 45.8	16 13 40.31	20 9 26.9	9.0	5.2	0.36
28	18 18.8	14 53 27.57	15 8 39.1	6.3	3.5	0.24	14	16 43.3	16 15 8.78	20 14 14.2	9.1	5.2	0.37
29	18 16.9	14 55 29.69	15 17 44.8	6.3	3.6	0.25	15	16 40.8	16 16 35.85	20 18 46.4	9.2	5.3	0.37
30	18 15.0	14 57 31.47	15 26 44.2	6.3	3.6	0.25	16	16 38.3	16 18 1.47	20 23 13.6	9.3	5.3	0.37
31	18 13.1	14 59 32.89	15 35 37.3	6.4	3.6	0.25	17	16 35.8	16 19 25.61	20 27 35.7	9.4	5.4	0.38
Feb. 1	18 11.2	15 1 33.94	15 44 24.1	6.4	3.6	0.25	18	16 33.3	16 20 48.23	20 31 52.9	9.5	5.4	0.38
2	18 9.2	15 3 34.61	15 53 4.7	6.5	3.7	0.26	19	16 30.7	16 22 9.28	20 36 5.3	9.6	5.5	0.39
3	18 7.3	15 5 34.88	16 1 38.9	6.5	3.7	0.26	20	16 28.1	16 23 28.71	20 40 13.0	9.7	5.5	0.39
4	18 5.4	15 7 34.75	16 10 6.8	6.6	3.7	0.26	21	16 25.4	16 24 46.49	20 44 16.1	9.8	5.6	0.40
5	18 3.4	15 9 34.21	16 18 28.5	6.6	3.8	0.26	22	16 22.7	16 26 2.57	20 48 14.7	9.9	5.7	0.40
6	18 1.5	15 11 33.22	16 26 43.6	6.7	3.8	0.26	23	16 20.0	16 27 16.94	20 52 8.8	10.0	5.7	0.41
7	17 59.5	15 13 31.78	16 34 52.4	6.7	3.8	0.26	24	16 17.3	16 28 29.54	20 55 58.7	10.1	5.8	0.41
8	17 57.5	15 15 29.87	16 42 54.9	6.8	3.9	0.27	25	16 14.6	16 29 40.31	20 59 44.3	10.2	5.8	0.41
9	17 55.6	15 17 27.46	16 50 51.0	6.8	3.9	0.27	26	16 11.8	16 30 49.23	21 3 25.8	10.3	5.9	0.42
10	17 53.6	15 19 24.55	16 58 40.6	6.9	3.9	0.27	27	16 9.0	16 31 56.37	21 7 3.4	10.4	6.0	0.42
11	17 51.6	15 21 21.12	17 6 23.8	6.9	4.0	0.27	28	16 6.1	16 33 1.38	21 10 37.2	10.6	6.0	0.43
12	17 49.6	15 23 17.13	17 14 0.6	7.0	4.0	0.28	29	16 3.2	16 34 4.53	21 14 7.3	10.7	6.1	0.43
13	17 47.6	15 25 12.57	17 21 31.0	7.0	4.0	0.28	30	16 0.3	16 35 5.66	21 17 33.7	10.8	6.1	0.44
14	17 45.5	15 27 7.41	17 28 54.9	7.1	4.1	0.28	31	15 57.4	16 36 4.72	21 20 56.7	10.9	6.2	0.44
15	17 43.5	15 29 1.63	17 36 12.3	7.2	4.1	0.28	Apr. 1	15 54.4	16 37 1.67	21 24 16.3	11.0	6.3	0.45
16	17 41.5	15 30 55.21	17 43 23.2	7.2	4.1	0.29	2	15 51.4	16 37 56.46	21 27 32.5	11.1	6.3	0.45

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	15 54.4	16 37 1.67	-21 24 16.3	11.0	6.3	0.45	May 17	12 46.8	16 30 18.31	-23 3 49.3	17.2	9.8	0.71
2	15 51.4	16 37 56.46	21 27 32.5	11.1	6.3	0.45	18	12 41.6	16 29 0.44	23 4 23.8	17.3	9.9	0.71
3	15 48.3	16 38 49.04	21 30 45.5	11.2	6.4	0.46	19	12 36.4	16 27 40.56	23 4 52.1	17.4	9.9	0.72
4	15 45.2	16 39 39.37	21 33 55.5	11.4	6.4	0.46	20	12 31.1	16 26 18.82	23 5 14.1	17.5	10.0	0.72
5	15 42.1	16 40 27.38	21 37 2.4	11.5	6.5	0.47	21	12 25.8	16 24 55.39	23 5 29.8	17.6	10.0	0.73
6	15 38.9	16 41 13.04	-21 40 6.3	11.6	6.6	0.47	22	12 20.4	16 23 30.47	-23 5 39.2	17.6	10.0	0.73
7	15 35.7	16 41 56.28	21 43 7.3	11.7	6.6	0.48	23	12 15.1	16 22 4.23	23 5 42.4	17.7	10.1	0.73
8	15 32.4	16 42 37.03	21 46 5.5	11.9	6.7	0.48	24	12 9.7	16 20 36.85	23 5 39.5	17.7	10.1	0.74
9	15 29.1	16 43 15.24	21 49 0.9	12.0	6.8	0.49	25	12 4.3	16 19 8.53	23 5 30.5	17.8	10.2	0.74
10	15 25.8	16 43 50.87	21 51 53.6	12.1	6.9	0.49	26	11 58.8	16 17 39.46	23 5 15.8	17.9	10.2	0.74
11	15 22.4	16 44 23.84	-21 54 43.6	12.2	7.0	0.50	27	11 53.4	16 16 9.83	-23 4 55.3	17.9	10.2	0.74
12	15 19.0	16 44 54.08	21 57 30.8	12.4	7.0	0.50	28	11 48.0	16 14 39.85	23 4 29.4	18.0	10.3	0.74
13	15 15.5	16 45 21.57	22 0 15.5	12.5	7.1	0.51	29	11 42.6	16 13 9.69	23 3 58.2	18.1	10.3	0.75
14	15 12.0	16 45 46.24	22 2 57.6	12.7	7.2	0.51	30	11 37.1	16 11 39.56	23 3 21.9	18.1	10.3	0.75
15	15 8.4	16 46 8.05	22 5 37.1	12.8	7.3	0.52	31	11 31.7	16 10 9.63	23 2 40.9	18.2	10.4	0.75
16	15 4.8	16 46 26.94	-22 8 14.1	12.9	7.4	0.53	June 1	11 26.2	16 8 40.11	-23 1 55.4	18.2	10.4	0.75
17	15 1.1	16 46 42.86	22 10 48.6	13.1	7.4	0.53	2	11 20.8	16 7 11.17	23 1 5.8	18.2	10.4	0.75
18	14 57.4	16 46 55.75	22 13 20.4	13.2	7.5	0.54	3	11 15.4	16 5 43.03	23 0 12.5	18.2	10.4	0.75
19	14 53.6	16 47 5.59	22 15 49.8	13.4	7.6	0.54	4	11 10.1	16 4 15.85	22 59 15.7	18.2	10.4	0.75
20	14 49.8	16 47 12.36	22 18 16.7	13.5	7.7	0.55	5	11 4.7	16 2 49.82	22 58 15.9	18.2	10.4	0.75
21	14 45.9	16 47 16.02	-22 20 41.1	13.6	7.8	0.56	6	10 59.4	16 1 25.10	-22 57 13.5	18.2	10.4	0.75
22	14 42.0	16 47 16.54	22 23 2.9	13.8	7.8	0.56	7	10 54.1	16 0 1.87	22 56 9.0	18.2	10.4	0.75
23	14 38.0	16 47 13.89	22 25 22.2	13.9	7.9	0.57	8	10 48.8	15 58 40.30	22 55 3.0	18.2	10.4	0.75
24	14 34.0	16 47 8.04	22 27 39.0	14.1	8.0	0.57	9	10 43.5	15 57 20.56	22 53 55.6	18.2	10.4	0.75
25	14 29.9	16 46 58.98	22 29 53.2	14.2	8.1	0.58	10	10 38.3	15 56 2.83	22 52 47.5	18.2	10.4	0.75
26	14 25.8	16 46 46.70	-22 32 4.7	14.3	8.2	0.59	11	10 33.1	15 54 47.27	-22 51 39.3	18.2	10.3	0.75
27	14 21.6	16 46 31.20	22 34 13.5	14.5	8.2	0.59	12	10 28.0	15 53 34.03	22 50 31.6	18.1	10.3	0.74
28	14 17.4	16 46 12.44	22 36 19.6	14.7	8.3	0.60	13	10 22.9	15 52 23.24	22 49 24.8	18.1	10.3	0.74
29	14 13.1	16 45 50.42	22 38 22.7	14.8	8.4	0.60	14	10 17.8	15 51 15.05	22 48 19.6	18.1	10.2	0.74
30	14 8.7	16 45 25.13	22 40 22.8	15.0	8.5	0.61	15	10 12.8	15 50 9.61	22 47 16.6	17.9	10.2	0.74
May 1	14 4.3	16 44 56.59	-22 42 19.6	15.1	8.6	0.62	16	10 7.8	15 49 7.04	-22 46 16.3	17.8	10.2	0.74
2	13 59.9	16 44 24.79	22 44 13.2	15.2	8.6	0.62	17	10 2.9	15 48 7.44	22 45 19.0	17.8	10.1	0.74
3	13 55.3	16 43 49.75	22 46 3.3	15.4	8.7	0.63	18	9 58.0	15 47 10.92	22 44 25.5	17.7	10.1	0.73
4	13 50.8	16 43 11.46	22 47 49.8	15.5	8.8	0.64	19	9 53.2	15 46 17.59	22 43 36.4	17.6	10.0	0.73
5	13 46.2	16 42 29.96	22 49 32.5	15.7	8.9	0.64	20	9 48.4	15 45 27.53	22 42 52.0	17.6	10.0	0.73
6	13 41.5	16 41 45.27	-22 51 11.1	15.8	9.0	0.65	21	9 43.7	15 44 40.80	-22 42 12.9	17.5	10.0	0.72
7	13 36.8	16 40 57.43	22 52 45.4	16.0	9.0	0.65	22	9 39.1	15 43 57.48	22 41 39.2	17.4	9.9	0.72
8	13 32.0	16 40 6.45	22 54 15.4	16.1	9.1	0.66	23	9 34.5	15 43 17.61	22 41 11.5	17.3	9.9	0.71
9	13 27.2	16 39 12.40	22 55 40.6	16.3	9.2	0.67	24	9 29.9	15 42 41.24	22 40 50.1	17.2	9.8	0.71
10	13 22.3	16 38 15.33	22 57 1.0	16.4	9.3	0.67	25	9 25.4	15 42 8.40	22 40 35.4	17.1	9.8	0.70
11	13 17.4	16 37 15.32	-22 58 16.2	16.5	9.4	0.68	26	9 21.0	15 41 39.12	-22 40 27.5	17.0	9.7	0.70
12	13 12.4	16 36 12.41	22 59 26.0	16.6	9.4	0.68	27	9 16.7	15 41 13.40	22 40 26.9	16.9	9.6	0.70
13	13 7.4	16 35 6.72	23 0 30.4	16.7	9.5	0.69	28	9 12.4	15 40 51.25	22 40 33.5	16.8	9.6	0.70
14	13 2.3	16 33 58.35	23 1 29.0	16.8	9.6	0.69	29	9 8.1	15 40 32.69	22 40 47.6	16.7	9.5	0.69
15	12 57.2	16 32 47.41	23 2 21.8	16.9	9.7	0.70	30	9 3.9	15 40 17.72	22 41 9.3	16.6	9.5	0.69
16	12 52.0	16 31 34.02	-23 3 8.6	17.1	9.7	0.70	July 1	8 59.8	15 40 6.30	-22 41 38.7	16.5	9.5	0.68
17	12 46.8	16 30 18.31	-23 3 49.3	17.2	9.8	0.71	2	8 55.8	15 39 58.43	-22 42 15.8	16.4	9.4	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	8 59.8	15 40 6.30	-22 41 38.7	16.5	9.5	0.68	Aug. 15	6 47.9	16 25 16.19	-24 49 51.8	11.9	6.8	0.49
2	8 55.8	15 39 58.43	-22 42 15.8	16.4	9.4	0.68	16	6 45.9	16 27 13.94	-24 53 38.8	11.8	6.7	0.49
3	8 51.8	15 39 54.11	-22 43 0.8	16.3	9.3	0.67	17	6 44.0	16 29 13.61	-24 57 23.6	11.7	6.7	0.49
4	8 47.8	15 39 53.31	-22 43 53.6	16.2	9.2	0.67	18	6 42.1	16 31 15.17	-25 1 5.8	11.6	6.6	0.48
5	8 43.9	15 39 56.03	-22 44 54.2	16.1	9.2	0.66	19	6 40.2	16 33 18.59	-25 4 45.2	11.5	6.6	0.48
6	8 40.1	15 40 2.22	-22 46 2.7	16.0	9.1	0.66	20	6 38.4	16 35 23.83	-25 8 21.6	11.4	6.5	0.48
7	8 36.3	15 40 11.88	-22 47 19.0	15.9	9.0	0.65	21	6 36.6	16 37 30.87	-25 11 54.5	11.4	6.4	0.48
8	8 32.6	15 40 24.99	-22 48 43.2	15.8	9.0	0.65	22	6 34.8	16 39 39.64	-25 15 23.6	11.3	6.4	0.47
9	8 29.0	15 40 41.52	-22 50 15.1	15.7	8.9	0.64	23	6 33.0	16 41 50.10	-25 18 48.5	11.2	6.3	0.47
10	8 25.4	15 41 1.44	-22 51 54.7	15.5	8.9	0.64	24	6 31.3	16 44 2.23	-25 22 9.0	11.1	6.3	0.47
11	8 21.8	15 41 24.72	-22 53 42.0	15.4	8.8	0.63	25	6 29.6	16 46 16.01	-25 25 24.9	11.0	6.3	0.46
12	8 18.3	15 41 51.35	-22 55 36.9	15.3	8.7	0.63	26	6 27.9	16 48 31.38	-25 28 35.7	11.0	6.2	0.46
13	8 14.9	15 42 21.31	-22 57 39.4	15.2	8.7	0.63	27	6 26.2	16 50 48.32	-25 31 41.1	10.9	6.2	0.46
14	8 11.5	15 42 54.58	-22 59 49.3	15.1	8.6	0.62	28	6 24.6	16 53 6.78	-25 34 40.9	10.8	6.1	0.45
15	8 8.2	15 43 31.11	-23 2 6.4	15.0	8.6	0.62	29	6 23.0	16 55 26.74	-25 37 34.9	10.7	6.1	0.45
16	8 4.9	15 44 10.84	-23 4 30.7	14.9	8.5	0.61	30	6 21.4	16 57 48.17	-25 40 22.5	10.7	6.1	0.45
17	8 1.7	15 44 53.75	-23 7 1.8	14.8	8.4	0.61	31	6 19.8	17 0 11.03	-25 43 3.6	10.6	6.0	0.45
18	7 58.5	15 45 30.78	-23 9 39.6	14.6	8.3	0.61	Sept. 1	6 18.3	17 2 35.30	-25 45 37.9	10.5	6.0	0.44
19	7 55.4	15 46 28.91	-23 12 24.0	14.5	8.2	0.60	2	6 16.8	17 5 0.94	-25 48 5.2	10.4	5.9	0.44
20	7 52.3	15 47 21.10	-23 15 14.7	14.4	8.2	0.60	3	6 15.3	17 7 27.94	-25 50 25.3	10.4	5.9	0.44
21	7 49.3	15 48 16.30	-23 18 11.5	14.3	8.1	0.59	4	6 13.8	17 9 56.28	-25 52 37.8	10.3	5.9	0.44
22	7 46.3	15 49 14.47	-23 21 14.1	14.2	8.0	0.59	5	6 12.4	17 12 25.93	-25 54 42.7	10.2	5.8	0.43
23	7 43.4	15 50 15.54	-23 24 22.2	14.1	8.0	0.58	6	6 11.0	17 14 56.86	-25 56 39.6	10.2	5.8	0.43
24	7 40.6	15 51 19.48	-23 27 35.6	14.0	7.9	0.58	7	6 9.6	17 17 29.06	-25 58 28.2	10.1	5.7	0.43
25	7 37.8	15 52 26.22	-23 30 53.8	13.9	7.9	0.57	8	6 8.2	17 20 2.49	-26 0 8.2	10.0	5.7	0.42
26	7 35.0	15 53 35.72	-23 34 16.7	13.8	7.8	0.57	9	6 6.8	17 22 37.14	-26 1 39.5	10.0	5.7	0.42
27	7 32.2	15 54 47.94	-23 37 43.9	13.7	7.7	0.56	10	6 5.5	17 25 12.98	-26 3 2.0	9.9	5.6	0.42
28	7 29.5	15 56 2.81	-23 41 15.1	13.6	7.7	0.56	11	6 4.2	17 27 49.99	-26 4 15.4	9.8	5.6	0.42
29	7 26.9	15 57 20.29	-23 44 50.0	13.5	7.6	0.55	12	6 2.9	17 30 28.16	-26 5 19.4	9.8	5.6	0.41
30	7 24.3	15 58 40.33	-23 48 28.2	13.4	7.6	0.55	13	6 1.6	17 33 7.45	-26 6 13.9	9.7	5.5	0.41
31	7 21.7	16 0 2.87	-23 52 9.4	13.3	7.5	0.55	14	6 0.3	17 35 47.83	-26 6 58.6	9.7	5.5	0.41
Aug. 1	7 19.2	16 1 27.87	-23 55 53.1	13.2	7.5	0.54	15	5 59.1	17 38 29.29	-26 7 33.3	9.6	5.5	0.41
2	7 16.7	16 2 55.30	-23 59 39.3	13.1	7.4	0.54	16	5 57.8	17 41 11.78	-26 7 57.8	9.5	5.4	0.41
3	7 14.3	16 4 25.11	-24 3 27.4	13.0	7.4	0.54	17	5 56.6	17 43 55.28	-26 8 11.9	9.5	5.4	0.40
4	7 11.9	16 5 57.26	-24 7 17.2	12.9	7.3	0.53	18	5 55.4	17 46 39.76	-26 8 15.4	9.4	5.4	0.40
5	7 9.5	16 7 31.73	-24 11 8.4	12.8	7.3	0.53	19	5 54.3	17 49 25.18	-26 8 8.1	9.3	5.4	0.40
6	7 7.2	16 9 8.47	-24 15 0.7	12.7	7.2	0.53	20	5 53.1	17 52 11.53	-26 7 49.9	9.3	5.3	0.40
7	7 4.9	16 10 47.45	-24 18 53.7	12.6	7.2	0.52	21	5 51.9	17 54 58.75	-26 7 20.5	9.2	5.3	0.39
8	7 2.7	16 12 28.63	-24 22 47.3	12.5	7.1	0.52	22	5 50.8	17 57 46.82	-26 6 39.7	9.2	5.3	0.39
9	7 0.5	16 14 11.99	-24 26 41.1	12.4	7.1	0.52	23	5 49.7	18 0 35.72	-26 5 47.4	9.1	5.2	0.39
10	6 58.3	16 15 57.49	-24 30 34.8	12.3	7.0	0.51	24	5 48.5	18 3 25.41	-26 4 43.4	9.1	5.2	0.39
11	6 56.2	16 17 45.12	-24 34 28.2	12.2	6.9	0.51	25	5 47.4	18 6 15.85	-26 3 27.6	9.0	5.2	0.38
12	6 54.1	16 19 34.83	-24 38 20.9	12.1	6.9	0.51	26	5 46.4	18 9 7.03	-26 1 59.8	9.0	5.1	0.38
13	6 52.0	16 21 26.59	-24 42 12.5	12.0	6.8	0.50	27	5 45.3	18 11 58.90	-26 0 19.9	8.9	5.1	0.38
14	6 49.9	16 23 20.39	-24 46 2.9	11.9	6.8	0.50	28	5 44.2	18 14 51.44	-25 58 27.7	8.9	5.1	0.38
15	6 47.9	16 25 16.19	-24 49 51.8	11.9	6.8	0.50	29	5 43.2	18 17 44.64	-25 56 23.2	8.8	5.0	0.37
16	6 45.9	16 27 13.94	-24 53 38.8	11.8	6.7	0.49	30	5 42.1	18 20 38.46	-25 54 6.2	8.8	5.0	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	"		h m	h m s	° ' "	"	"	"
May 1	18 12.7	20 54 0.56	-17 57 6.2	1.8	18.8	1.40	June 16	15 15.2	20 57 20.89	-17 53 50.9	2.0	21.6	1.61
2	18 9.1	20 54 21.31	17 55 54.2	1.8	18.8	1.41	17	15 11.0	20 57 7.65	17 54 59.5	2.0	21.7	1.62
3	18 5.5	20 54 41.39	17 54 44.9	1.8	18.9	1.41	18	15 6.9	20 56 53.68	17 56 11.0	2.0	21.7	1.62
4	18 1.9	20 55 0.79	17 53 38.3	1.8	18.9	1.42	19	15 2.7	20 56 39.01	17 57 25.3	2.1	21.8	1.63
5	17 58.3	20 55 19.51	17 52 34.4	1.8	19.0	1.42	20	14 58.5	20 56 23.64	17 58 42.4	2.1	21.9	1.63
6	17 54.7	20 55 37.54	-17 51 33.3	1.8	19.0	1.42	21	14 54.3	20 56 7.58	-18 0 2.1	2.1	21.9	1.64
7	17 51.0	20 55 54.89	17 50 34.9	1.8	19.1	1.43	22	14 50.1	20 55 50.84	18 1 24.5	2.1	22.0	1.64
8	17 47.3	20 56 11.53	17 49 39.4	1.8	19.1	1.43	23	14 45.9	20 55 33.43	18 2 49.4	2.1	22.0	1.65
9	17 43.7	20 56 27.47	17 48 46.9	1.8	19.2	1.44	24	14 41.6	20 55 15.36	18 4 16.9	2.1	22.1	1.65
10	17 40.0	20 56 42.70	17 47 57.2	1.8	19.3	1.44	25	14 37.4	20 54 56.64	18 5 46.8	2.1	22.1	1.65
11	17 36.3	20 56 57.22	-17 47 10.4	1.8	19.4	1.45	26	14 33.1	20 54 37.28	-18 7 19.2	2.1	22.2	1.66
12	17 32.6	20 57 11.01	17 46 26.6	1.8	19.4	1.45	27	14 28.9	20 54 17.29	18 8 53.9	2.1	22.2	1.66
13	17 28.9	20 57 24.09	17 45 45.8	1.8	19.5	1.46	28	14 24.6	20 53 56.69	18 10 30.8	2.1	22.3	1.66
14	17 25.2	20 57 36.43	17 45 8.0	1.8	19.5	1.46	29	14 20.3	20 53 35.49	18 12 10.0	2.1	22.3	1.67
15	17 21.4	20 57 48.03	17 44 33.2	1.8	19.6	1.47	30	14 16.0	20 53 13.69	18 13 51.3	2.1	22.4	1.67
16	17 17.7	20 57 58.90	-17 44 1.5	1.8	19.6	1.47	July 1	14 11.7	20 52 51.31	-18 15 34.6	2.1	22.4	1.68
17	17 13.9	20 58 9.02	17 43 32.9	1.9	19.7	1.48	2	14 7.4	20 52 28.36	18 17 19.9	2.1	22.5	1.68
18	17 10.1	20 58 18.40	17 43 7.5	1.9	19.8	1.48	3	14 3.1	20 52 4.86	18 19 7.1	2.1	22.5	1.69
19	17 6.3	20 58 27.03	17 42 45.1	1.9	19.9	1.48	4	13 58.8	20 51 40.82	18 20 56.2	2.1	22.6	1.69
20	17 2.6	20 58 34.91	17 42 25.9	1.9	19.9	1.49	5	13 54.4	20 51 16.25	18 22 47.1	2.1	22.6	1.69
21	16 58.8	20 58 42.04	-17 42 9.9	1.9	20.0	1.49	6	13 50.1	20 50 51.17	-18 24 39.7	2.1	22.6	1.69
22	16 54.9	20 58 48.41	17 41 57.1	1.9	20.0	1.50	7	13 45.7	20 50 26.59	18 26 33.9	2.1	22.7	1.70
23	16 51.1	20 58 54.02	17 41 47.4	1.9	20.1	1.50	8	13 41.4	20 49 59.53	18 28 29.6	2.1	22.7	1.70
24	16 47.2	20 58 58.87	17 41 41.0	1.9	20.2	1.51	9	13 37.0	20 49 33.00	18 30 26.8	2.1	22.8	1.70
25	16 43.4	20 59 2.97	17 41 37.7	1.9	20.2	1.51	10	13 32.6	20 49 6.01	18 32 25.4	2.1	22.8	1.70
26	16 39.5	20 59 6.30	-17 41 37.7	1.9	20.3	1.52	11	13 28.2	20 48 38.59	-18 34 25.2	2.1	22.8	1.71
27	16 35.6	20 59 8.87	17 41 40.9	1.9	20.4	1.52	12	13 23.8	20 48 10.76	18 36 26.3	2.1	22.9	1.71
28	16 31.7	20 59 10.68	17 41 47.3	1.9	20.5	1.53	13	13 19.4	20 47 42.52	18 38 28.4	2.1	22.9	1.71
29	16 27.8	20 59 11.73	17 41 56.9	1.9	20.5	1.53	14	13 15.0	20 47 13.91	18 40 31.6	2.2	22.9	1.71
30	16 23.9	20 59 12.02	17 42 9.7	1.9	20.6	1.54	15	13 10.6	20 46 44.94	18 42 35.6	2.2	22.9	1.72
31	16 19.9	20 59 11.55	-17 42 25.8	1.9	20.6	1.54	16	13 6.2	20 46 15.84	-18 44 40.5	2.2	22.9	1.72
June 1	16 16.0	20 59 10.32	17 42 45.0	1.9	20.7	1.54	17	13 1.7	20 45 46.02	18 46 46.2	2.2	23.0	1.72
2	16 12.0	20 59 8.32	17 43 7.4	2.0	20.7	1.55	18	12 57.3	20 45 16.11	18 48 52.5	2.2	23.0	1.72
3	16 8.0	20 59 5.57	17 43 33.1	2.0	20.8	1.55	19	12 52.9	20 44 45.93	18 50 59.3	2.2	23.0	1.73
4	16 4.0	20 59 2.05	17 44 1.9	2.0	20.9	1.56	20	12 48.5	20 44 15.50	18 53 6.5	2.2	23.0	1.73
5	16 0.0	20 58 57.77	-17 44 33.8	2.0	21.0	1.56	21	12 44.0	20 43 44.85	-18 55 14.1	2.2	23.0	1.73
6	15 56.0	20 58 52.73	17 45 9.0	2.0	21.0	1.57	22	12 39.6	20 43 13.99	18 57 21.9	2.2	23.0	1.73
7	15 52.0	20 58 46.93	17 45 47.3	2.0	21.1	1.57	23	12 35.1	20 42 42.95	18 59 29.9	2.2	23.1	1.73
8	15 48.0	20 58 40.37	17 46 28.8	2.0	21.1	1.58	24	12 30.7	20 42 11.75	19 1 38.0	2.2	23.1	1.73
9	15 43.9	20 58 33.06	17 47 13.3	2.0	21.2	1.58	25	12 26.2	20 41 40.41	19 3 46.0	2.2	23.1	1.73
10	15 39.8	20 58 24.99	-17 48 1.0	2.0	21.2	1.59	26	12 21.8	20 41 8.96	-19 5 53.8	2.2	23.1	1.74
11	15 35.8	20 58 16.17	17 48 51.8	2.0	21.3	1.59	27	12 17.3	20 40 37.41	19 8 1.5	2.2	23.1	1.74
12	15 31.7	20 58 6.59	17 49 45.6	2.0	21.4	1.59	28	12 12.9	20 40 5.80	19 10 8.8	2.2	23.1	1.74
13	15 27.6	20 57 56.27	17 50 42.4	2.0	21.4	1.60	29	12 8.4	20 39 34.14	19 12 15.7	2.2	23.1	1.74
14	15 23.5	20 57 45.22	17 51 42.3	2.0	21.5	1.60	30	12 3.9	20 39 2.45	19 14 22.1	2.2	23.1	1.74
15	15 19.3	20 57 33.42	-17 52 45.1	2.0	21.5	1.61	31	11 59.4	20 38 30.76	-19 16 28.0	2.2	23.1	1.74
16	15 15.2	20 57 20.89	-17 53 50.9	2.0	21.6	1.61	Aug. 1	11 55.0	20 37 50.09	-19 18 33.1	2.2	23.1	1.74

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Peri. Mor.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Peri. Mor.
	h m	h m s	° ' "	"	"	"		h m	h m s	° ' "	"	"	"
Aug. 1	11 55.0	20 37 59.09	19 18 33.1	2.2	23.1	1.74	Sept. 16	8 36.3	20 30 3.27	20 23 27.8	2.0	21.5	1.63
2	11 50.5	20 37 37.46	19 20 37.5	2.2	23.1	1.74	17	8 32.2	20 19 54.41	20 23 55.8	2.0	21.4	1.62
3	11 46.1	20 36 55.89	19 22 41.1	2.2	23.1	1.74	18	8 28.1	20 19 46.34	20 24 21.1	2.0	21.4	1.62
4	11 41.6	20 36 24.41	19 24 43.8	2.2	23.1	1.74	19	8 24.1	20 19 39.08	20 24 43.6	2.0	21.3	1.61
5	11 37.1	20 35 53.04	19 26 45.4	2.2	23.1	1.74	20	8 20.0	20 19 32.63	20 25 3.3	2.0	21.3	1.61
6	11 32.7	20 35 21.79	19 28 46.0	2.2	23.1	1.74	21	8 16.0	20 19 26.98	20 25 20.3	2.0	21.2	1.61
7	11 28.3	20 34 50.69	19 30 45.5	2.2	23.1	1.74	22	8 12.0	20 19 22.13	20 25 34.5	2.0	21.1	1.60
8	11 23.8	20 34 19.77	19 32 43.8	2.2	23.1	1.74	23	8 8.0	20 19 18.10	20 25 45.9	2.0	21.1	1.60
9	11 19.3	20 33 49.05	19 34 40.7	2.2	23.1	1.74	24	8 4.0	20 19 14.88	20 25 54.5	2.0	21.0	1.59
10	11 14.9	20 33 18.54	19 36 36.3	2.2	23.0	1.74	25	8 0.0	20 19 12.46	20 26 0.4	2.0	20.9	1.59
11	11 10.5	20 32 48.28	19 38 30.5	2.2	23.0	1.73	26	7 56.1	20 19 10.86	20 26 3.5	2.0	20.9	1.58
12	11 6.0	20 32 18.28	19 40 23.2	2.2	23.0	1.73	27	7 52.1	20 19 10.08	20 26 3.9	2.0	20.8	1.58
13	11 1.6	20 31 48.57	19 42 14.3	2.2	23.0	1.73	28	7 48.2	20 19 10.11	20 26 1.6	2.0	20.8	1.57
14	10 57.2	20 31 19.17	19 44 3.6	2.2	22.9	1.73	29	7 44.3	20 19 10.95	20 25 56.5	1.9	20.7	1.57
15	10 52.8	20 30 50.11	19 45 51.3	2.2	22.9	1.73	30	7 40.4	20 19 12.60	20 25 48.7	1.9	20.6	1.56
16	10 48.4	20 30 21.41	19 47 37.1	2.2	22.9	1.73	Oct. 1	7 36.5	20 19 15.06	20 25 38.1	1.9	20.6	1.56
17	10 44.0	20 29 53.09	19 49 21.2	2.2	22.9	1.73	2	7 32.6	20 19 18.33	20 25 24.9	1.9	20.5	1.55
18	10 39.6	20 29 25.17	19 51 3.2	2.1	22.8	1.72	3	7 28.7	20 19 22.41	20 25 8.9	1.9	20.4	1.55
19	10 35.2	20 28 57.67	19 52 43.3	2.1	22.8	1.72	4	7 24.9	20 19 27.31	20 24 50.1	1.9	20.4	1.54
20	10 30.8	20 28 30.61	19 54 21.4	2.1	22.8	1.72	5	7 21.0	20 19 33.01	20 24 28.7	1.9	20.3	1.54
21	10 26.4	20 28 4.00	19 55 57.5	2.1	22.7	1.72	6	7 17.2	20 19 39.51	20 24 4.6	1.9	20.2	1.53
22	10 22.1	20 27 37.88	19 57 31.3	2.1	22.7	1.72	7	7 13.4	20 19 46.82	20 23 37.7	1.9	20.2	1.53
23	10 17.7	20 27 12.96	19 59 3.0	2.1	22.7	1.71	8	7 9.6	20 19 54.93	20 23 8.1	1.9	20.1	1.52
24	10 13.4	20 26 47.14	20 0 32.5	2.1	22.6	1.71	9	7 5.8	20 20 3.84	20 22 35.9	1.9	20.1	1.52
25	10 9.1	20 26 22.55	20 1 59.8	2.1	22.6	1.71	10	7 2.1	20 20 13.55	20 22 1.0	1.9	20.0	1.51
26	10 4.7	20 25 58.51	20 3 24.7	2.1	22.6	1.71	11	6 58.3	20 20 24.07	20 21 23.3	1.9	20.0	1.51
27	10 0.4	20 25 35.04	20 4 47.2	2.1	22.5	1.70	12	6 54.6	20 20 35.37	20 20 43.0	1.9	19.9	1.50
28	9 56.1	20 25 12.13	20 6 7.4	2.1	22.5	1.70	13	6 50.8	20 20 47.46	20 19 59.9	1.9	19.8	1.50
29	9 51.8	20 24 49.82	20 7 25.3	2.1	22.4	1.70	14	6 47.1	20 21 0.34	20 19 14.2	1.9	19.7	1.49
30	9 47.5	20 24 28.12	20 8 40.6	2.1	22.4	1.69	15	6 43.4	20 21 14.00	20 18 25.8	1.9	19.7	1.49
31	9 43.2	20 24 7.03	20 9 53.5	2.1	22.3	1.69	16	6 39.7	20 21 28.44	20 17 34.8	1.8	19.6	1.48
Sept. 1	9 39.0	20 23 46.56	20 11 4.0	2.1	22.3	1.69	17	6 36.0	20 21 43.64	20 16 41.2	1.8	19.6	1.48
2	9 34.7	20 23 26.73	20 12 11.9	2.1	22.2	1.68	18	6 32.4	20 21 59.61	20 15 44.8	1.8	19.5	1.48
3	9 30.4	20 23 7.57	20 13 17.3	2.1	22.2	1.68	19	6 28.7	20 22 16.33	20 14 45.8	1.8	19.4	1.47
4	9 26.2	20 22 49.08	20 14 20.1	2.1	22.1	1.68	20	6 25.1	20 22 33.80	20 13 44.2	1.8	19.4	1.47
5	9 22.0	20 22 31.26	20 15 20.4	2.1	22.1	1.67	21	6 21.5	20 22 52.02	20 12 39.9	1.8	19.3	1.46
6	9 17.8	20 22 14.13	20 16 18.0	2.1	22.0	1.67	22	6 17.9	20 23 10.97	20 11 33.0	1.8	19.3	1.46
7	9 13.6	20 21 57.71	20 17 13.1	2.1	22.0	1.66	23	6 14.3	20 23 30.65	20 10 23.5	1.8	19.2	1.45
8	9 9.4	20 21 42.00	20 18 5.6	2.1	21.9	1.66	24	6 10.7	20 23 51.06	20 9 11.4	1.8	19.1	1.45
9	9 5.0	20 21 27.01	20 18 55.3	2.1	21.9	1.65	25	6 7.1	20 24 12.18	20 7 56.7	1.8	19.1	1.44
10	9 1.2	20 21 12.76	20 19 42.4	2.1	21.8	1.65	26	6 3.5	20 24 34.02	20 6 39.4	1.8	19.0	1.44
11	8 56.8	20 20 59.27	20 20 26.8	2.1	21.8	1.64	27	5 59.9	20 24 56.56	20 5 19.6	1.8	19.0	1.43
12	8 52.7	20 20 46.53	20 21 8.5	2.0	21.7	1.64	28	5 56.4	20 25 19.80	20 3 57.3	1.8	18.9	1.43
13	8 48.6	20 20 34.55	20 21 47.5	2.0	21.7	1.64	29	5 52.9	20 25 43.73	20 2 32.4	1.8	18.8	1.42
14	8 44.5	20 20 23.34	20 22 23.7	2.0	21.6	1.63	30	5 49.3	20 26 8.33	20 1 4.9	1.8	18.8	1.42
15	8 40.4	20 20 12.91	20 22 57.1	2.0	21.6	1.63	31	5 45.8	20 26 33.61	19 59 34.9	1.8	18.7	1.41
16	8 36.3	20 20 3.27	20 23 27.8	2.0	21.5	1.63	Nov. 1	5 42.3	20 26 59.56	19 58 2.5	1.8	18.7	1.41

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Semi- Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Semi- Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 1	15 36.6	10 24 20.12	+11 40 6.7	1.0	9.1	0.66	Feb. 15	12 29.0	10 13 39.34	+12 48 45.8	1.1	9.4	0.69
2	15 32.5	10 24 12.46	11 41 5.2	1.0	9.1	0.66	16	12 24.8	10 13 20.95	12 50 34.2	1.1	9.4	0.69
3	15 28.5	10 24 4.41	11 42 5.8	1.0	9.1	0.66	17	12 20.5	10 13 2.54	12 52 22.5	1.1	9.5	0.69
4	15 24.4	10 23 55.98	11 43 8.4	1.0	9.1	0.66	18	12 16.3	10 12 44.10	12 54 10.5	1.1	9.5	0.69
5	15 20.3	10 23 47.17	11 44 13.1	1.0	9.1	0.66	19	12 12.1	10 12 25.66	12 55 58.2	1.1	9.5	0.69
6	15 16.2	10 23 38.00	+11 45 19.8	1.0	9.2	0.67	20	12 7.8	10 12 7.22	+12 57 45.6	1.1	9.5	0.69
7	15 12.1	10 23 28.46	11 46 28.4	1.0	9.2	0.67	21	12 3.6	10 11 48.79	12 59 32.6	1.1	9.5	0.69
8	15 8.0	10 23 18.56	11 47 38.9	1.0	9.2	0.67	22	11 59.3	10 11 30.39	13 1 19.1	1.1	9.4	0.69
9	15 3.9	10 23 8.30	11 48 51.4	1.0	9.2	0.67	23	11 55.1	10 11 12.02	13 3 5.1	1.1	9.4	0.69
10	14 59.8	10 22 57.68	11 50 5.7	1.0	9.2	0.67	24	11 50.9	10 10 53.69	13 4 50.5	1.1	9.4	0.69
11	14 55.7	10 22 46.71	+11 51 21.9	1.0	9.2	0.67	25	11 46.6	10 10 35.42	+13 6 35.2	1.1	9.4	0.69
12	14 51.6	10 22 35.40	11 52 39.8	1.0	9.2	0.67	26	11 42.4	10 10 17.22	13 8 19.2	1.1	9.4	0.69
13	14 47.5	10 22 23.76	11 53 59.5	1.0	9.2	0.67	27	11 38.2	10 9 59.10	13 10 2.5	1.1	9.4	0.69
14	14 43.3	10 22 11.78	11 55 20.9	1.1	9.2	0.68	28	11 33.9	10 9 41.06	13 11 44.9	1.1	9.4	0.69
15	14 39.2	10 21 59.48	11 56 44.0	1.1	9.3	0.68	Mar. 1	11 29.7	10 9 23.11	13 13 26.4	1.1	9.4	0.69
16	14 35.1	10 21 46.86	+11 58 8.7	1.1	9.3	0.68	2	11 25.5	10 9 5.27	+13 15 7.1	1.1	9.4	0.69
17	14 30.9	10 21 33.92	11 59 34.9	1.1	9.3	0.68	3	11 21.2	10 8 47.55	13 16 46.7	1.1	9.4	0.69
18	14 26.8	10 21 20.67	12 1 2.7	1.1	9.3	0.68	4	11 17.0	10 8 29.95	13 18 25.4	1.1	9.4	0.69
19	14 22.6	10 21 7.12	12 2 32.0	1.1	9.3	0.68	5	11 12.8	10 8 12.49	13 20 3.1	1.1	9.4	0.69
20	14 18.4	10 20 53.28	12 4 2.8	1.1	9.3	0.68	6	11 8.6	10 7 55.15	13 21 39.6	1.1	9.4	0.69
21	14 14.3	10 20 39.16	+12 5 34.9	1.1	9.3	0.68	7	11 4.3	10 7 37.98	+13 23 14.9	1.1	9.4	0.69
22	14 10.1	10 20 24.76	12 7 8.5	1.1	9.3	0.68	8	11 0.1	10 7 20.97	13 24 49.0	1.1	9.4	0.69
23	14 5.9	10 20 10.09	12 8 43.2	1.1	9.3	0.68	9	10 55.9	10 7 4.13	13 26 21.9	1.1	9.4	0.69
24	14 1.8	10 19 55.17	12 10 19.2	1.1	9.3	0.68	10	10 51.7	10 6 47.46	13 27 53.6	1.1	9.4	0.69
25	13 57.6	10 19 39.99	12 11 56.4	1.1	9.4	0.68	11	10 47.5	10 6 30.98	13 29 23.9	1.1	9.4	0.69
26	13 53.4	10 19 24.57	+12 13 34.6	1.1	9.4	0.68	12	10 43.3	10 6 14.70	+13 30 52.8	1.1	9.4	0.69
27	13 49.2	10 19 8.91	12 15 13.9	1.1	9.4	0.68	13	10 39.1	10 5 58.62	13 32 20.3	1.1	9.4	0.69
28	13 45.0	10 18 53.03	12 16 54.3	1.1	9.4	0.68	14	10 34.9	10 5 42.76	13 33 46.3	1.1	9.4	0.69
29	13 40.8	10 18 36.94	12 18 35.6	1.1	9.4	0.68	15	10 30.7	10 5 27.12	13 35 10.8	1.1	9.4	0.69
30	13 36.6	10 18 20.65	12 20 17.7	1.1	9.4	0.68	16	10 26.5	10 5 11.72	13 36 33.8	1.1	9.4	0.69
31	13 32.4	10 18 4.16	+12 22 0.7	1.1	9.4	0.69	17	10 22.3	10 4 56.56	+13 37 55.1	1.1	9.3	0.69
Feb. 1	13 28.2	10 17 47.48	12 23 44.4	1.1	9.4	0.69	18	10 18.2	10 4 41.64	13 39 14.9	1.1	9.3	0.69
2	13 24.0	10 17 30.62	12 25 28.8	1.1	9.4	0.69	19	10 14.0	10 4 26.98	13 40 33.0	1.1	9.3	0.68
3	13 19.8	10 17 13.59	12 27 13.9	1.1	9.4	0.69	20	10 9.8	10 4 12.59	13 41 49.4	1.1	9.3	0.68
4	13 15.5	10 16 56.40	12 28 59.6	1.1	9.4	0.69	21	10 5.6	10 3 58.47	13 43 4.1	1.1	9.3	0.68
5	13 11.3	10 16 39.06	+12 30 45.9	1.1	9.4	0.69	22	10 1.4	10 3 44.62	+13 44 17.0	1.1	9.3	0.68
6	13 7.1	10 16 21.58	12 32 32.6	1.1	9.4	0.69	23	9 57.3	10 3 31.06	13 45 28.1	1.1	9.3	0.68
7	13 2.9	10 16 3.95	12 34 19.8	1.1	9.4	0.69	24	9 53.2	10 3 17.80	13 46 37.4	1.1	9.3	0.68
8	12 58.6	10 15 46.20	12 36 7.3	1.1	9.4	0.69	25	9 49.0	10 3 4.84	13 47 44.8	1.1	9.3	0.68
9	12 54.4	10 15 28.34	12 37 55.2	1.1	9.4	0.69	26	9 44.9	10 2 52.19	13 48 50.2	1.1	9.2	0.68
10	12 50.2	10 15 10.38	+12 39 43.3	1.1	9.4	0.69	27	9 40.8	10 2 39.86	+13 49 53.7	1.0	9.2	0.68
11	12 45.9	10 14 52.32	12 41 31.6	1.1	9.4	0.69	28	9 36.6	10 2 27.85	13 50 55.4	1.0	9.2	0.68
12	12 41.7	10 14 34.18	12 43 20.1	1.1	9.4	0.69	29	9 32.5	10 2 16.16	13 51 55.0	1.0	9.2	0.68
13	12 37.5	10 14 15.96	12 45 8.7	1.1	9.4	0.69	30	9 28.4	10 2 4.80	13 52 52.7	1.0	9.2	0.68
14	12 33.2	10 13 57.68	12 46 57.2	1.1	9.4	0.69	31	9 24.3	10 1 53.78	13 53 48.4	1.0	9.2	0.67
15	12 29.0	10 13 39.34	+12 48 45.8	1.1	9.4	0.69	Apr. 1	9 20.2	10 1 43.10	+13 54 42.1	1.0	9.2	0.67
16	12 24.8	10 13 20.95	+12 50 34.2	1.1	9.4	0.69	2	9 16.1	10 1 32.76	+13 55 33.8	1.0	9.2	0.67

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	"		h m	h m s	° ' "	"	"	"
Apr. 1	9 20.2	10 143.10	+13 54 42.1	1.0	9.2	0.67	Nov. 16	19 24.3	11 10 18.85	+7 15 29.1	0.9	8.1	0.58
2	9 16.1	10 132.76	13 55 33.8	1.0	9.2	0.67	17	19 20.6	11 10 34.37	7 14 6.9	0.9	8.1	0.58
3	9 12.0	10 122.77	13 56 23.3	1.0	9.2	0.67	18	19 16.9	11 10 49.56	7 12 46.9	0.9	8.1	0.58
4	9 7.9	10 113.14	13 57 10.8	1.0	9.2	0.67	19	19 13.2	11 11 4.41	7 11 29.0	0.9	8.1	0.58
5	9 3.9	10 1 3.87	13 57 56.2	1.0	9.1	0.67	20	19 9.5	11 11 18.93	7 10 13.3	0.9	8.2	0.59
6	8 59.7	10 0 54.96	+13 58 39.4	1.0	9.1	0.67	21	19 5.8	11 11 33.12	+7 8 59.8	0.9	8.2	0.59
7	8 55.6	10 0 46.42	13 59 20.5	1.0	9.1	0.67	22	19 2.1	11 11 46.97	7 7 48.6	0.9	8.2	0.59
8	8 51.6	10 0 38.24	13 59 59.5	1.0	9.1	0.67	23	18 58.4	11 12 0.47	7 6 39.6	0.9	8.2	0.59
9	8 47.5	10 0 30.43	14 0 36.4	1.0	9.1	0.67	24	18 54.7	11 12 13.62	7 5 32.8	0.9	8.2	0.59
10	8 43.5	10 0 23.00	14 1 11.1	1.0	9.1	0.67	25	18 51.0	11 12 26.43	7 4 28.3	0.9	8.2	0.59
11	8 39.4	10 0 15.94	+14 1 43.7	1.0	9.0	0.66	26	18 47.3	11 12 38.89	+7 3 26.1	0.9	8.2	0.59
12	8 35.4	10 0 9.28	14 2 14.1	1.0	9.0	0.66	27	18 43.5	11 12 50.98	7 2 26.2	0.9	8.3	0.59
13	8 31.3	10 0 3.00	14 2 42.4	1.0	9.0	0.66	28	18 39.8	11 13 2.72	7 1 28.6	0.9	8.3	0.59
14	8 27.3	9 59 57.11	14 3 8.4	1.0	9.0	0.66	29	18 36.1	11 13 14.10	7 0 33.4	0.9	8.3	0.59
15	8 23.3	9 59 51.61	14 3 32.2	1.0	9.0	0.66	30	18 32.3	11 13 25.11	6 59 40.6	0.9	8.3	0.60
16	8 19.2	9 59 46.53	+14 3 53.7	1.0	9.0	0.66	Dec. 1	18 28.6	11 13 35.76	+6 58 50.1	0.9	8.3	0.60
17	8 15.2	9 59 41.83	14 4 13.0	1.0	8.9	0.66	2	18 24.8	11 13 46.03	6 58 2.1	0.9	8.3	0.60
18	8 11.2	9 59 37.53	14 4 30.1	1.0	8.9	0.66	3	18 21.0	11 13 55.93	6 57 16.5	0.9	8.3	0.60
19	8 7.2	9 59 33.63	14 4 45.0	1.0	8.9	0.66	4	18 17.2	11 14 5.46	6 56 33.3	0.9	8.4	0.60
20	8 3.3	9 59 30.14	14 4 57.6	1.0	8.9	0.65	5	18 13.5	11 14 14.60	6 55 52.6	1.0	8.4	0.60
21	7 59.3	9 59 27.06	+14 5 8.0	1.0	8.9	0.65	6	18 9.7	11 14 23.36	+6 55 14.4	1.0	8.4	0.60
22	7 55.3	9 59 24.36	14 5 16.1	1.0	8.9	0.65	7	18 5.9	11 14 31.73	6 54 38.6	1.0	8.4	0.60
23	7 51.3	9 59 22.11	14 5 22.1	1.0	8.9	0.65	8	18 2.1	11 14 39.72	6 54 5.3	1.0	8.4	0.61
24	7 47.4	9 59 20.25	14 5 25.7	1.0	8.8	0.65	9	17 58.3	11 14 47.31	6 53 34.6	1.0	8.4	0.61
25	7 43.4	9 59 18.80	14 5 27.1	1.0	8.8	0.65	10	17 54.4	11 14 54.51	6 53 6.5	1.0	8.4	0.61
26	7 39.5	9 59 17.77	+14 5 26.3	1.0	8.8	0.65	11	17 50.6	11 15 1.32	+6 52 40.8	1.0	8.5	0.61
27	7 35.5	9 59 17.14	14 5 23.2	1.0	8.8	0.65	12	17 46.8	11 15 7.72	6 52 17.7	1.0	8.5	0.61
28	7 31.6	9 59 16.92	14 5 17.9	1.0	8.8	0.64	13	17 43.0	11 15 13.72	6 51 57.2	1.0	8.5	0.61
29	7 27.7	9 59 17.11	14 5 10.4	1.0	8.8	0.64	14	17 39.1	11 15 19.33	6 51 39.3	1.0	8.5	0.61
30	7 23.7	9 59 17.71	14 5 0.6	1.0	8.7	0.64	15	17 35.3	11 15 24.53	6 51 23.9	1.0	8.5	0.61
May 1	7 19.8	9 59 18.72	+14 4 48.7	1.0	8.7	0.64	16	17 31.4	11 15 29.33	+6 51 11.1	1.0	8.5	0.62
2	7 15.9	9 59 20.13	14 4 34.5	1.0	8.7	0.64	17	17 27.6	11 15 33.72	6 51 0.9	1.0	8.5	0.62
3	7 12.0	9 59 21.95	14 4 18.2	1.0	8.7	0.64	18	17 23.7	11 15 37.71	6 50 53.3	1.0	8.6	0.62
4	7 8.1	9 59 24.18	14 3 59.6	1.0	8.7	0.64	19	17 19.8	11 15 41.30	6 50 48.3	1.0	8.6	0.62
5	7 4.2	9 59 26.81	14 3 38.9	1.0	8.7	0.64	20	17 16.0	11 15 44.48	6 50 45.8	1.0	8.6	0.62
6	7 0.3	9 59 29.85	+14 3 16.0	1.0	8.7	0.63	21	17 12.1	11 15 47.24	+6 50 45.9	1.0	8.6	0.62
7	6 56.5	9 59 33.28	14 2 50.9	1.0	8.6	0.63	22	17 8.2	11 15 49.60	6 50 48.6	1.0	8.6	0.62
8	6 52.6	9 59 37.12	14 2 23.6	1.0	8.6	0.63	23	17 4.3	11 15 51.56	6 50 53.9	1.0	8.6	0.62
9	6 48.7	9 59 41.36	14 1 54.1	1.0	8.6	0.63	24	17 0.4	11 15 53.11	6 51 1.8	1.0	8.6	0.62
10	6 44.9	9 59 46.00	14 1 22.6	1.0	8.6	0.63	25	16 56.5	11 15 54.25	6 51 12.2	1.0	8.7	0.63
11	6 41.0	9 59 51.03	+14 0 48.8	1.0	8.6	0.63	26	16 52.6	11 15 54.99	+6 51 25.1	1.0	8.7	0.63
12	6 37.2	9 59 56.47	14 0 12.9	1.0	8.6	0.63	27	16 48.6	11 15 55.32	6 51 40.7	1.0	8.7	0.63
13	6 33.3	10 0 2.30	13 59 35.0	1.0	8.5	0.63	28	16 44.7	11 15 55.24	6 51 58.8	1.0	8.7	0.63
14	6 29.5	10 0 8.53	13 58 54.9	1.0	8.5	0.62	29	16 40.8	11 15 54.74	6 52 19.4	1.0	8.7	0.63
15	6 25.7	10 0 15.15	13 57 12.8	1.0	8.5	0.62	30	16 36.8	11 15 53.84	6 52 42.5	1.0	8.8	0.63
16	6 21.9	10 0 22.17	+13 57 28.6	1.0	8.5	0.62	31	16 32.9	11 15 52.54	+6 53 8.2	1.0	8.8	0.63
17	6 18.1	10 0 29.57	+13 56 42.3	1.0	8.5	0.62	32	16 28.9	11 15 50.84	+6 53 36.5	1.0	8.8	0.63

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	" s		h m	h m s	° ' "	"	"	" s
Jan. 15	17 56.3	13 39 37.32	-9 43 7.6	0.5	1.8	0.12	Mar. 1	14 58.2	13 38 25.95	-9 35 8.8	0.5	1.9	0.13
16	17 52.4	13 39 40.27	9 43 22.8	0.5	1.8	0.12	2	14 54.1	13 38 19.99	9 34 33.4	0.5	1.9	0.13
17	17 48.5	13 39 43.02	9 43 36.8	0.5	1.8	0.12	3	14 50.1	13 38 13.87	9 33 57.1	0.5	1.9	0.13
18	17 44.6	13 39 45.56	9 43 49.6	0.5	1.8	0.12	4	14 46.1	13 38 7.59	9 33 20.0	0.5	1.9	0.13
19	17 40.7	13 39 47.88	9 44 1.2	0.5	1.8	0.12	5	14 42.0	13 38 1.16	9 32 42.0	0.5	1.9	0.13
20	17 36.8	13 39 49.99	-9 44 11.5	0.5	1.8	0.12	6	14 38.0	13 37 54.58	-9 32 3.1	0.5	1.9	0.13
21	17 32.9	13 39 51.89	9 44 20.7	0.5	1.8	0.12	7	14 33.9	13 37 47.85	9 31 23.4	0.5	1.9	0.13
22	17 29.0	13 39 53.57	9 44 28.6	0.5	1.8	0.12	8	14 29.9	13 37 40.98	9 30 42.9	0.5	1.9	0.13
23	17 25.1	13 39 55.05	9 44 35.3	0.5	1.8	0.12	9	14 25.8	13 37 33.96	9 30 1.6	0.5	1.9	0.13
24	17 21.2	13 39 56.31	9 44 40.8	0.5	1.8	0.12	10	14 21.8	13 37 26.81	9 29 19.5	0.5	1.9	0.13
25	17 17.3	13 39 57.36	-9 44 45.1	0.5	1.8	0.12	11	14 17.7	13 37 19.52	-9 28 36.7	0.5	1.9	0.13
26	17 13.4	13 39 58.19	9 44 48.2	0.5	1.8	0.12	12	14 13.7	13 37 12.09	9 27 53.1	0.5	1.9	0.13
27	17 9.5	13 39 58.81	9 44 50.1	0.5	1.8	0.12	13	14 9.6	13 37 4.54	9 27 8.8	0.5	1.9	0.13
28	17 5.5	13 39 59.23	9 44 50.8	0.5	1.8	0.12	14	14 5.6	13 36 56.86	9 26 23.7	0.5	1.9	0.13
29	17 1.6	13 39 59.43	9 44 50.2	0.5	1.8	0.12	15	14 1.5	13 36 49.05	9 25 38.0	0.5	1.9	0.13
30	16 57.7	13 39 59.42	-9 44 48.5	0.5	1.8	0.12	16	13 57.5	13 36 41.13	-9 24 51.6	0.5	1.9	0.13
31	16 53.7	13 39 59.20	9 44 45.6	0.5	1.8	0.12	17	13 53.4	13 36 33.09	9 24 4.5	0.5	1.9	0.13
Feb. 1	16 49.8	13 39 58.78	9 44 41.5	0.5	1.8	0.12	18	13 49.3	13 36 24.94	9 23 16.8	0.5	1.9	0.13
2	16 45.8	13 39 58.14	9 44 36.2	0.5	1.8	0.13	19	13 45.3	13 36 16.68	9 22 28.5	0.5	1.9	0.13
3	16 41.9	13 39 57.30	9 44 29.7	0.5	1.9	0.13	20	13 41.2	13 36 8.31	9 21 39.7	0.5	1.9	0.13
4	16 37.9	13 39 56.25	-9 44 22.0	0.5	1.9	0.13	21	13 37.1	13 35 59.85	-9 20 50.2	0.5	1.9	0.13
5	16 34.0	13 39 54.99	9 44 13.2	0.5	1.9	0.13	22	13 33.1	13 35 51.28	9 20 0.2	0.5	1.9	0.13
6	16 30.0	13 39 53.53	9 44 3.3	0.5	1.9	0.13	23	13 29.0	13 35 42.62	9 19 9.7	0.5	1.9	0.13
7	16 26.1	13 39 51.86	9 43 52.1	0.5	1.9	0.13	24	13 24.9	13 35 33.88	9 18 18.7	0.5	1.9	0.13
8	16 22.1	13 39 49.99	9 43 39.8	0.5	1.9	0.13	25	13 20.8	13 35 25.05	9 17 27.2	0.5	1.9	0.13
9	16 18.1	13 39 47.91	-9 43 26.4	0.5	1.9	0.13	26	13 16.7	13 35 16.14	-9 16 35.3	0.5	1.9	0.13
10	16 14.2	13 39 45.63	9 43 11.8	0.5	1.9	0.13	27	13 12.6	13 35 7.15	9 15 43.0	0.5	1.9	0.13
11	16 10.2	13 39 43.15	9 42 56.0	0.5	1.9	0.13	28	13 8.6	13 34 58.09	9 14 50.3	0.5	1.9	0.13
12	16 6.2	13 39 40.48	9 42 39.2	0.5	1.9	0.13	29	13 4.5	13 34 48.97	9 13 57.2	0.5	1.9	0.13
13	16 2.2	13 39 37.60	9 42 21.2	0.5	1.9	0.13	30	13 0.4	13 34 39.77	9 13 3.7	0.5	1.9	0.13
14	15 58.3	13 39 34.52	-9 42 2.1	0.5	1.9	0.13	31	12 56.3	13 34 30.52	-9 12 9.9	0.5	1.9	0.13
15	15 54.3	13 39 31.26	9 41 41.9	0.5	1.9	0.13	Apr. 1	12 52.2	13 34 21.22	9 11 15.8	0.5	1.9	0.13
16	15 50.3	13 39 27.79	9 41 20.6	0.5	1.9	0.13	2	12 48.1	13 34 11.96	9 10 21.4	0.5	1.9	0.13
17	15 46.3	13 39 24.13	9 40 58.2	0.5	1.9	0.13	3	12 44.0	13 34 2.45	9 9 26.8	0.5	1.9	0.13
18	15 42.3	13 39 20.28	9 40 34.7	0.5	1.9	0.13	4	12 39.9	13 33 53.00	9 8 31.9	0.5	1.9	0.13
19	15 38.3	13 39 16.24	-9 40 10.1	0.5	1.9	0.13	5	12 35.9	13 33 43.51	-9 7 36.8	0.5	1.9	0.13
20	15 34.3	13 39 12.01	9 39 44.5	0.5	1.9	0.13	6	12 31.8	13 33 33.98	9 6 41.6	0.5	1.9	0.13
21	15 30.3	13 39 7.60	9 39 17.9	0.5	1.9	0.13	7	12 27.7	13 33 24.42	9 5 46.1	0.5	1.9	0.13
22	15 26.3	13 39 3.01	9 38 50.2	0.5	1.9	0.13	8	12 23.6	13 33 14.83	9 4 50.5	0.5	1.9	0.13
23	15 22.3	13 38 58.23	9 38 21.5	0.5	1.9	0.13	9	12 19.5	13 33 5.22	9 3 54.8	0.5	1.9	0.13
24	15 18.3	13 38 53.28	-9 37 51.8	0.5	1.9	0.13	10	12 15.4	13 32 55.59	-9 2 59.0	0.5	1.9	0.13
25	15 14.3	13 38 48.15	9 37 21.1	0.5	1.9	0.13	11	12 11.3	13 32 45.93	9 2 3.1	0.5	1.9	0.13
26	15 10.2	13 38 42.85	9 36 49.5	0.5	1.9	0.13	12	12 7.2	13 32 36.27	9 1 7.2	0.5	1.9	0.13
27	15 6.2	13 38 37.38	9 36 16.9	0.5	1.9	0.13	13	12 3.1	13 32 26.60	9 0 11.2	0.5	1.9	0.13
28	15 2.2	13 38 31.75	9 35 43.3	0.5	1.9	0.13	14	11 59.0	13 32 16.93	8 59 15.2	0.5	1.9	0.13
Mar. 1	14 58.2	13 38 25.95	-9 35 8.8	0.5	1.9	0.13	15	11 54.9	13 32 7.25	-8 58 19.3	0.5	1.9	0.13
2	14 54.1	13 38 19.99	-9 34 33.4	0.5	1.9	0.13	16	11 50.8	13 31 57.58	-8 57 23.4	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' " "	"	"	"		h m	h m s	° ' " "	"	"	"
Apr. 16	11 50.8	13 31 57.58	-8 57 23.4	0.5	1.9	0.13	June 1	8 43.8	13 25 46.00	-8 22 2.4	0.5	1.9	0.13
17	11 46.7	13 31 47.93	8 56 27.5	0.5	1.9	0.13	2	8 39.8	13 25 40.77	8 21 33.5	0.5	1.9	0.13
18	11 42.6	13 31 38.28	8 55 31.8	0.5	1.9	0.13	3	8 35.8	13 25 35.71	8 21 5.6	0.5	1.9	0.13
19	11 38.5	13 31 28.65	8 54 36.2	0.5	1.9	0.13	4	8 31.8	13 25 30.82	8 20 38.8	0.5	1.9	0.13
20	11 34.5	13 31 19.04	8 53 40.7	0.5	1.9	0.13	5	8 27.7	13 25 26.09	8 20 12.9	0.5	1.9	0.13
21	11 30.4	13 31 9.47	-8 52 45.5	0.5	1.9	0.13	6	8 23.7	13 25 21.53	-8 19 48.1	0.5	1.9	0.13
22	11 26.3	13 30 59.93	8 51 50.4	0.5	1.9	0.13	7	8 19.7	13 25 17.14	8 19 24.3	0.5	1.9	0.13
23	11 22.2	13 30 50.41	8 50 55.5	0.5	1.9	0.13	8	8 15.7	13 25 12.92	8 19 1.5	0.5	1.9	0.13
24	11 18.1	13 30 40.94	8 50 0.9	0.5	1.9	0.13	9	8 11.7	13 25 8.88	8 18 39.8	0.5	1.9	0.13
25	11 14.0	13 30 31.52	8 49 6.6	0.5	1.9	0.13	10	8 7.7	13 25 5.02	8 18 19.1	0.5	1.9	0.13
26	11 9.9	13 30 22.14	-8 48 12.6	0.5	1.9	0.13	11	8 3.8	13 25 1.33	-8 17 50.5	0.5	1.9	0.13
27	11 5.8	13 30 12.81	8 47 18.9	0.5	1.9	0.13	12	7 59.8	13 24 57.82	8 17 41.0	0.5	1.9	0.13
28	11 1.8	13 30 3.54	8 46 25.5	0.5	1.9	0.13	13	7 55.8	13 24 54.50	8 17 23.6	0.5	1.9	0.13
29	10 57.7	13 29 54.33	8 45 32.5	0.5	1.9	0.13	14	7 51.8	13 24 51.35	8 17 7.2	0.5	1.9	0.13
30	10 53.6	13 29 45.18	8 44 39.9	0.5	1.9	0.13	15	7 47.8	13 24 48.39	8 16 52.0	0.5	1.9	0.13
May 1	10 49.5	13 29 36.09	-8 43 47.7	0.5	1.9	0.13	16	7 43.8	13 24 45.62	-8 16 37.9	0.5	1.9	0.13
2	10 45.4	13 29 27.08	8 42 55.9	0.5	1.9	0.13	17	7 39.9	13 24 43.04	8 16 24.9	0.5	1.9	0.13
3	10 41.4	13 29 18.14	8 42 4.6	0.5	1.9	0.13	18	7 35.9	13 24 40.65	8 16 13.0	0.5	1.9	0.13
4	10 37.3	13 29 9.28	8 41 13.8	0.5	1.9	0.13	19	7 31.9	13 24 38.44	8 16 2.3	0.5	1.9	0.13
5	10 33.2	13 29 0.49	8 40 23.5	0.5	1.9	0.13	20	7 28.0	13 24 36.42	8 15 52.8	0.5	1.9	0.13
6	10 29.1	13 28 51.79	-8 39 33.6	0.5	1.9	0.13	21	7 24.0	13 24 34.60	-8 15 44.3	0.5	1.9	0.13
7	10 25.0	13 28 43.18	8 38 44.4	0.5	1.9	0.13	22	7 20.0	13 24 32.97	8 15 37.1	0.5	1.9	0.13
8	10 21.0	13 28 34.66	8 37 55.6	0.5	1.9	0.13	23	7 16.1	13 24 31.53	8 15 30.9	0.5	1.9	0.13
9	10 16.9	13 28 26.24	8 37 7.4	0.5	1.9	0.13	24	7 12.1	13 24 30.28	8 15 26.0	0.5	1.9	0.13
10	10 12.8	13 28 17.91	8 36 19.8	0.5	1.9	0.13	25	7 8.2	13 24 29.23	8 15 22.2	0.5	1.9	0.12
11	10 8.8	13 28 9.68	-8 35 32.9	0.5	1.9	0.13	26	7 4.2	13 24 28.37	-8 15 19.5	0.5	1.9	0.12
12	10 4.7	13 28 1.56	8 34 46.6	0.5	1.9	0.13	27	7 0.3	13 24 27.71	8 15 18.0	0.5	1.8	0.12
13	10 0.6	13 27 53.55	8 34 0.9	0.5	1.9	0.13	28	6 56.4	13 24 27.24	8 15 17.7	0.5	1.8	0.12
14	9 56.6	13 27 45.64	8 33 15.9	0.5	1.9	0.13	29	6 52.4	13 24 26.97	8 15 18.5	0.5	1.8	0.12
15	9 52.5	13 27 37.86	8 32 31.6	0.5	1.9	0.13	30	6 48.5	13 24 26.89	8 15 20.5	0.5	1.8	0.12
16	9 48.5	13 27 30.19	-8 31 48.0	0.5	1.9	0.13	July 1	6 44.5	13 24 27.01	-8 15 23.7	0.5	1.8	0.12
17	9 44.4	13 27 22.64	8 31 5.1	0.5	1.9	0.13	2	6 40.6	13 24 27.32	8 15 28.0	0.5	1.8	0.12
18	9 40.3	13 27 15.21	8 30 23.0	0.5	1.9	0.13	3	6 36.7	13 24 27.62	8 15 33.5	0.5	1.8	0.12
19	9 36.3	13 27 7.92	8 29 41.7	0.5	1.9	0.13	4	6 32.8	13 24 28.52	8 15 40.1	0.5	1.8	0.12
20	9 32.2	13 27 0.76	8 29 1.1	0.5	1.9	0.13	5	6 28.8	13 24 29.42	8 15 47.9	0.5	1.8	0.12
21	9 28.2	13 26 53.72	-8 28 21.4	0.5	1.9	0.13	6	6 24.9	13 24 30.51	-8 15 56.9	0.5	1.8	0.12
22	9 24.1	13 26 46.83	8 27 42.5	0.5	1.9	0.13	7	6 21.0	13 24 31.80	8 16 7.0	0.5	1.8	0.12
23	9 20.1	13 26 40.08	8 27 4.4	0.5	1.9	0.13	8	6 17.1	13 24 33.28	8 16 18.3	0.5	1.8	0.12
24	9 16.1	13 26 33.47	8 26 27.2	0.5	1.9	0.13	9	6 13.2	13 24 34.96	8 16 30.7	0.5	1.8	0.12
25	9 12.0	13 26 27.00	8 25 50.9	0.5	1.9	0.13	10	6 9.3	13 24 36.84	8 16 44.3	0.5	1.8	0.12
26	9 8.0	13 26 20.68	-8 25 15.5	0.5	1.9	0.13	11	6 5.4	13 24 38.92	-8 16 59.1	0.5	1.8	0.12
27	9 4.0	13 26 14.52	8 24 41.0	0.5	1.9	0.13	12	6 1.5	13 24 41.19	8 17 15.1	0.5	1.8	0.12
28	8 59.9	13 26 8.50	8 24 7.4	0.5	1.9	0.13	13	5 57.6	13 24 43.65	8 17 32.2	0.5	1.8	0.12
29	8 55.9	13 26 2.64	8 23 34.7	0.5	1.9	0.13	14	5 53.7	13 24 46.31	8 17 50.4	0.5	1.8	0.12
30	8 51.9	13 25 56.93	8 23 3.0	0.5	1.9	0.13	15	5 49.9	13 24 49.17	8 18 9.8	0.5	1.8	0.12
31	8 47.8	13 25 51.39	-8 22 32.2	0.5	1.9	0.13	16	5 46.0	13 24 52.92	-8 18 30.3	0.5	1.8	0.12
June 1	8 43.8	13 25 46.00	-8 22 2.4	0.5	1.9	0.13	17	5 42.1	13 24 55.47	-8 18 52.0	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 1	9 15.1	4 1 47.55	+18 57 32.3	0.3	1.3	0.09	Feb. 15	6 16.4	4 0 0.90	+18 54 59.8	0.3	1.3	0.09
2	9 11.0	4 1 42.51	18 57 20.7	0.3	1.3	0.09	16	6 12.5	4 0 1.67	18 55 5.8	0.3	1.3	0.09
3	9 7.0	4 1 37.57	18 57 9.3	0.3	1.3	0.09	17	6 8.5	4 0 2.52	18 55 12.2	0.3	1.3	0.09
4	9 3.0	4 1 32.73	18 56 58.3	0.3	1.3	0.09	18	6 4.6	4 0 3.63	18 55 19.0	0.3	1.3	0.09
5	8 59.0	4 1 27.99	18 56 47.6	0.3	1.3	0.09	19	6 0.7	4 0 4.82	18 55 26.2	0.3	1.3	0.09
6	8 55.0	4 1 23.35	+18 56 37.2	0.3	1.3	0.09	20	5 56.8	4 0 6.15	+18 55 33.8	0.3	1.3	0.09
7	8 51.0	4 1 18.83	18 56 27.2	0.3	1.3	0.09	21	5 52.9	4 0 7.63	18 55 41.8	0.3	1.3	0.09
8	8 47.0	4 1 14.42	18 56 17.6	0.3	1.3	0.09	22	5 49.0	4 0 9.21	18 55 50.2	0.3	1.3	0.09
9	8 43.0	4 1 10.11	18 56 8.3	0.3	1.3	0.09	23	5 45.1	4 0 11.01	18 55 59.1	0.3	1.3	0.09
10	8 39.0	4 1 5.92	18 55 59.3	0.3	1.3	0.09	24	5 41.2	4 0 12.91	18 56 8.3	0.3	1.3	0.09
11	8 35.0	4 1 1.85	+18 55 50.7	0.3	1.3	0.09	25	5 37.3	4 0 14.96	+18 56 17.9	0.3	1.3	0.09
12	8 31.0	4 0 57.88	18 55 42.4	0.3	1.3	0.09	26	5 33.4	4 0 17.15	18 56 27.9	0.3	1.3	0.09
13	8 27.0	4 0 54.03	18 55 34.5	0.3	1.3	0.09	27	5 29.5	4 0 19.47	18 56 38.3	0.3	1.3	0.09
14	8 23.0	4 0 50.30	18 55 27.0	0.3	1.3	0.09	28	5 25.6	4 0 21.93	18 56 49.1	0.3	1.3	0.09
15	8 19.0	4 0 46.70	18 55 19.9	0.3	1.3	0.09	Mar. 1	5 21.7	4 0 24.54	18 57 0.3	0.3	1.3	0.09
16	8 15.0	4 0 43.22	+18 55 13.2	0.3	1.3	0.09	Sept. 1	17 34.9	4 21 0.79	+19 51 21.3	0.3	1.3	0.09
17	8 11.0	4 0 39.86	18 55 6.8	0.3	1.3	0.09	2	17 31.0	4 21 1.75	19 51 20.5	0.3	1.3	0.09
18	8 7.1	4 0 36.63	18 55 0.9	0.3	1.3	0.09	3	17 27.1	4 21 2.58	19 51 19.4	0.3	1.3	0.09
19	8 3.1	4 0 33.52	18 54 55.3	0.3	1.3	0.09	4	17 23.1	4 21 3.26	19 51 17.9	0.3	1.3	0.09
20	7 59.1	4 0 30.54	18 54 50.1	0.3	1.3	0.09	5	17 19.2	4 21 3.81	19 51 16.2	0.3	1.3	0.09
21	7 55.1	4 0 27.69	+18 54 45.3	0.3	1.3	0.09	6	17 15.3	4 21 4.22	+19 51 14.1	0.3	1.3	0.09
22	7 51.1	4 0 24.97	18 54 40.9	0.3	1.3	0.09	7	17 11.3	4 21 4.49	19 51 11.7	0.3	1.3	0.09
23	7 47.2	4 0 22.38	18 54 37.0	0.3	1.3	0.09	8	17 7.4	4 21 4.62	19 51 9.0	0.3	1.3	0.09
24	7 43.2	4 0 19.93	18 54 33.4	0.3	1.3	0.09	9	17 3.5	4 21 4.62	19 51 5.9	0.3	1.3	0.09
25	7 39.2	4 0 17.61	18 54 30.3	0.3	1.3	0.09	10	16 59.5	4 21 4.46	19 51 2.5	0.3	1.3	0.09
26	7 35.2	4 0 15.43	+18 54 27.5	0.3	1.3	0.09	11	16 55.6	4 21 4.16	+19 50 58.8	0.3	1.3	0.09
27	7 31.3	4 0 13.38	18 54 25.2	0.3	1.3	0.09	12	16 51.7	4 21 3.73	19 50 54.7	0.3	1.3	0.09
28	7 27.3	4 0 11.46	18 54 23.3	0.3	1.3	0.09	13	16 47.7	4 21 3.16	19 50 50.3	0.3	1.3	0.09
29	7 23.4	4 0 9.69	18 54 21.8	0.3	1.3	0.09	14	16 43.8	4 21 2.45	19 50 45.6	0.3	1.3	0.09
30	7 19.4	4 0 8.05	18 54 20.7	0.3	1.3	0.09	15	16 39.8	4 21 1.61	19 50 40.6	0.3	1.3	0.09
31	7 15.4	4 0 6.55	+18 54 20.0	0.3	1.3	0.09	16	16 35.9	4 21 0.63	+19 50 35.3	0.3	1.3	0.09
Feb. 1	7 11.5	4 0 5.18	18 54 19.7	0.3	1.3	0.09	17	16 31.9	4 20 59.51	19 50 29.7	0.3	1.3	0.09
2	7 7.5	4 0 3.96	18 54 19.9	0.3	1.3	0.09	18	16 28.0	4 20 58.25	19 50 23.8	0.3	1.3	0.09
3	7 3.6	4 0 2.88	18 54 20.4	0.3	1.3	0.09	19	16 24.0	4 20 56.85	19 50 17.5	0.3	1.3	0.09
4	6 59.6	4 0 1.94	18 54 21.4	0.3	1.3	0.09	20	16 20.1	4 20 55.32	19 50 10.9	0.3	1.3	0.09
5	6 55.7	4 0 1.13	+18 54 22.8	0.3	1.3	0.09	21	16 16.1	4 20 53.65	+19 50 4.0	0.3	1.3	0.09
6	6 51.7	4 0 0.47	18 54 24.7	0.3	1.3	0.09	22	16 12.1	4 20 51.85	19 49 56.9	0.3	1.3	0.09
7	6 47.8	3 59 59.95	18 54 26.9	0.3	1.3	0.09	23	16 8.2	4 20 49.92	19 49 49.4	0.3	1.3	0.09
8	6 43.9	3 59 59.57	18 54 29.6	0.3	1.3	0.09	24	16 4.2	4 20 47.86	19 49 41.6	0.3	1.3	0.09
9	6 39.9	3 59 59.33	18 54 32.6	0.3	1.3	0.09	25	16 0.3	4 20 45.66	19 49 33.6	0.3	1.3	0.09
10	6 36.0	3 59 59.24	+18 54 36.1	0.3	1.3	0.09	26	15 56.3	4 20 43.33	+19 49 25.2	0.3	1.3	0.09
11	6 32.1	3 59 59.29	18 54 40.0	0.3	1.3	0.09	27	15 52.3	4 20 40.86	19 49 16.5	0.3	1.3	0.09
12	6 28.1	3 59 59.48	18 54 44.3	0.3	1.3	0.09	28	15 48.3	4 20 38.27	19 49 7.6	0.3	1.3	0.09
13	6 24.2	3 59 59.81	18 54 49.1	0.3	1.3	0.09	29	15 44.4	4 20 35.56	19 48 58.4	0.3	1.3	0.09
14	6 20.3	4 0 0.28	18 54 54.2	0.3	1.3	0.09	30	15 40.4	4 20 32.72	19 48 48.9	0.3	1.3	0.09
15	6 16.4	4 0 0.90	+18 54 59.8	0.3	1.3	0.09	Oct. 1	15 36.4	4 20 29.75	+19 48 39.2	0.3	1.3	0.09
16	6 12.5	4 0 1.67	+18 55 5.8	0.3	1.3	0.09	2	15 32.4	4 20 26.66	+19 48 29.1	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi- diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	15 36.4	4 20 29.75	+19 48 39.2	0.3	1.3	0.09	Nov. 16	12 31.5	4 16 23.78	+19 37 22.0	0.3	1.3	0.09
2	15 32.4	4 20 26.66	19 48 29.1	0.3	1.3	0.09	17	12 27.4	4 16 16.85	19 37 4.4	0.3	1.3	0.09
3	15 28.4	4 20 23.44	19 48 18.8	0.3	1.3	0.09	18	12 23.4	4 16 9.89	19 36 46.7	0.3	1.3	0.09
4	15 24.4	4 20 20.10	19 48 8.2	0.3	1.3	0.09	19	12 19.3	4 16 2.90	19 36 29.0	0.3	1.3	0.09
5	15 20.4	4 20 16.62	19 47 57.4	0.3	1.3	0.09	20	12 15.3	4 15 55.89	19 36 11.3	0.3	1.3	0.09
6	15 16.4	4 20 13.02	+19 47 46.2	0.3	1.3	0.09	21	12 11.2	4 15 48.86	+19 35 53.6	0.3	1.3	0.09
7	15 12.5	4 20 9.33	19 47 34.8	0.3	1.3	0.09	22	12 7.2	4 15 41.81	19 35 35.9	0.3	1.3	0.09
8	15 8.5	4 20 5.51	19 47 23.2	0.3	1.3	0.09	23	12 3.1	4 15 34.76	19 35 18.2	0.3	1.3	0.09
9	15 4.5	4 20 1.57	19 47 11.3	0.3	1.3	0.09	24	11 59.1	4 15 27.70	19 35 0.6	0.3	1.3	0.09
10	15 0.5	4 19 57.52	19 46 59.2	0.3	1.3	0.09	25	11 55.0	4 15 20.63	19 34 43.0	0.3	1.3	0.09
11	14 56.5	4 19 53.35	+19 46 46.9	0.3	1.3	0.09	26	11 51.0	4 15 13.56	+19 34 25.4	0.3	1.3	0.09
12	14 52.5	4 19 49.06	19 46 34.3	0.3	1.3	0.09	27	11 46.9	4 15 6.48	19 34 7.9	0.3	1.3	0.09
13	14 48.5	4 19 44.66	19 46 21.4	0.3	1.3	0.09	28	11 42.9	4 14 59.40	19 33 50.4	0.3	1.3	0.09
14	14 44.5	4 19 40.15	19 46 8.3	0.3	1.3	0.09	29	11 38.8	4 14 52.31	19 33 32.9	0.3	1.3	0.09
15	14 40.4	4 19 35.54	19 45 55.0	0.3	1.3	0.09	30	11 34.8	4 14 45.23	19 33 15.5	0.3	1.3	0.09
16	14 36.4	4 19 30.83	+19 45 41.4	0.3	1.3	0.09	Dec. 1	11 30.7	4 14 38.17	+19 32 58.2	0.3	1.3	0.09
17	14 32.4	4 19 26.01	19 45 27.7	0.3	1.3	0.09	2	11 26.7	4 14 31.13	19 32 40.9	0.3	1.3	0.09
18	14 28.4	4 19 21.10	19 45 13.8	0.3	1.3	0.09	3	11 22.6	4 14 24.10	19 32 23.8	0.3	1.3	0.09
19	14 24.4	4 19 16.08	19 44 59.6	0.3	1.3	0.09	4	11 18.6	4 14 17.09	19 32 6.7	0.3	1.3	0.09
20	14 20.4	4 19 10.95	19 44 45.2	0.3	1.3	0.09	5	11 14.5	4 14 10.10	19 31 49.8	0.3	1.3	0.09
21	14 16.4	4 19 5.73	+19 44 30.6	0.3	1.3	0.09	6	11 10.5	4 14 3.13	+19 31 32.9	0.3	1.3	0.09
22	14 12.3	4 19 0.42	19 44 15.9	0.3	1.3	0.09	7	11 6.4	4 13 56.18	19 31 16.1	0.3	1.3	0.09
23	14 8.3	4 18 55.02	19 44 1.0	0.3	1.3	0.09	8	11 2.4	4 13 49.25	19 30 59.4	0.3	1.3	0.09
24	14 4.3	4 18 49.54	19 43 45.9	0.3	1.3	0.09	9	10 58.3	4 13 42.36	19 30 42.9	0.3	1.3	0.09
25	14 0.3	4 18 43.97	19 43 30.6	0.3	1.3	0.09	10	10 54.3	4 13 35.52	19 30 26.6	0.3	1.3	0.09
26	13 56.2	4 18 38.31	+19 43 15.2	0.3	1.3	0.09	11	10 50.2	4 13 28.71	+19 30 10.3	0.3	1.3	0.09
27	13 52.2	4 18 32.57	19 42 59.6	0.3	1.3	0.09	12	10 46.2	4 13 21.94	19 29 54.3	0.3	1.3	0.09
28	13 48.2	4 18 26.74	19 42 43.8	0.3	1.3	0.09	13	10 42.2	4 13 15.22	19 29 38.4	0.3	1.3	0.09
29	13 44.2	4 18 20.83	19 42 27.9	0.3	1.3	0.09	14	10 38.1	4 13 8.54	19 29 22.6	0.3	1.3	0.09
30	13 40.1	4 18 14.84	19 42 11.8	0.3	1.3	0.09	15	10 34.1	4 13 1.90	19 29 7.0	0.3	1.3	0.09
31	13 36.1	4 18 8.79	+19 41 55.6	0.3	1.3	0.09	16	10 30.0	4 12 55.31	+19 28 51.6	0.3	1.3	0.09
Nov. 1	13 32.1	4 18 2.67	19 41 39.3	0.3	1.3	0.09	17	10 26.0	4 12 48.79	19 28 36.4	0.3	1.3	0.09
2	13 28.0	4 17 56.48	19 41 22.9	0.3	1.3	0.09	18	10 22.0	4 12 42.33	19 28 21.4	0.3	1.3	0.09
3	13 24.0	4 17 50.22	19 41 6.3	0.3	1.3	0.09	19	10 17.9	4 12 35.93	19 28 6.6	0.3	1.3	0.09
4	13 20.0	4 17 43.90	19 40 49.6	0.3	1.3	0.09	20	10 13.9	4 12 29.60	19 27 52.0	0.3	1.3	0.09
5	13 15.9	4 17 37.50	+19 40 32.7	0.3	1.3	0.09	21	10 9.8	4 12 23.32	+19 27 37.6	0.3	1.3	0.09
6	13 11.9	4 17 31.04	19 40 15.7	0.3	1.3	0.09	22	10 5.8	4 12 17.11	19 27 23.4	0.3	1.3	0.09
7	13 7.8	4 17 24.52	19 39 58.7	0.3	1.3	0.09	23	10 1.8	4 12 10.96	19 27 9.4	0.3	1.3	0.09
8	13 3.8	4 17 17.96	19 39 41.6	0.3	1.3	0.09	24	9 57.8	4 12 4.89	19 26 55.7	0.3	1.3	0.09
9	12 59.8	4 17 11.35	19 39 24.4	0.3	1.3	0.09	25	9 53.7	4 11 58.89	19 26 42.2	0.3	1.3	0.09
10	12 55.7	4 17 4.69	+19 39 7.1	0.3	1.3	0.09	26	9 49.7	4 11 52.98	+19 26 29.0	0.3	1.3	0.09
11	12 51.7	4 16 57.98	19 38 49.8	0.3	1.3	0.09	27	9 45.7	4 11 47.15	19 26 16.1	0.3	1.3	0.09
12	12 47.6	4 16 51.22	19 38 32.3	0.3	1.3	0.09	28	9 41.6	4 11 41.40	19 26 3.3	0.3	1.3	0.09
13	12 43.6	4 16 44.41	19 38 14.8	0.3	1.3	0.09	29	9 37.6	4 11 35.74	19 25 50.8	0.3	1.3	0.09
14	12 39.5	4 16 37.56	19 37 57.2	0.3	1.3	0.09	30	9 33.6	4 11 30.15	19 25 38.6	0.3	1.3	0.09
15	12 35.5	4 16 30.68	+19 37 39.0	0.3	1.3	0.09	31	9 29.5	4 11 24.65	+19 25 26.6	0.3	1.3	0.09
16	12 31.5	4 16 23.78	+19 37 22.0	0.3	1.3	0.09	32	9 25.5	4 11 19.24	+19 25 15.0	0.3	1.3	0.09

PART III

P H E N O M E N A

ECLIPSES IN 1890.

In the year 1890 there will be three eclipses, two of the sun and one of the moon, and a Lunar Appulse.

A Lunar Appulse, 1890, June 2, the moon being visible at Washington.

Greenwich mean time of δ in right ascension, $\begin{smallmatrix} d & h & m & s \\ 2 & 18 & 19 & 44.6 \end{smallmatrix}$

Greenwich mean time of nearest approach, $\begin{smallmatrix} h & m \\ 18 & 45.1 \end{smallmatrix}$

Angle of position of point of nearest approach from north point 167° to West.

The nearness of the approach and the uncertainty as to the effect of the earth's atmosphere render it doubtful whether the moon will enter the shadow of the earth or not.

I.—An Annular Eclipse of the Sun, 1890, June 16–17, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, June $\begin{smallmatrix} d & h & m & s \\ 16 & 21 & 58 & 30.7 \end{smallmatrix}$

Sun and moon's R. A.	$\begin{smallmatrix} h & m & s \\ 5 & 43 & 1.45 \end{smallmatrix}$	Hourly motions	$\begin{smallmatrix} s \\ 10.40 \text{ and } 132.11 \end{smallmatrix}$
Sun's declination	$23^\circ 2' 46.6''$ N.	Hourly motion	$0' 4.2''$ N.
Moon's declination	$23^\circ 36' 8.3''$ N.	Hourly motion	$3' 42.0''$ N.
Sun's equa. hor. parallax	8.4	Sun's true semidiameter	15 44.5
Moon's equa. hor. parallax	54 46.0	Moon's true semidiameter	14 54.7

. CIRCUMSTANCES OF THE ECLIPSE.

		Longitude from Greenwich.	Latitude.
Eclipse begins	June $\begin{smallmatrix} d & h & m \\ 16 & 18 & 55.0 \end{smallmatrix}$	$13^\circ 55.6'$ W.	$0^\circ 43.5'$ N.
Central eclipse begins	16 20 1.5	$32^\circ 25.5'$ W.	5 3.9 N.
Central eclipse at noon	16 21 58.5	$30^\circ 31.2'$ E.	$36^\circ 40.4'$ N.
Central eclipse ends	16 23 48.7	$101^\circ 25.8'$ E.	$18^\circ 43.2'$ N.
Eclipse ends	17 0 55.2	$82^\circ 43.4'$ E.	$14^\circ 23.9'$ N.

II.—*A Partial Eclipse of the Moon*, 1890, November 25–26, invisible at Washington; but visible generally in Asia, India, and the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, November 26				^d ^h ^m ^s			
Sun's right ascension	16	9	7.57	Hourly motion	10.66		
Moon's right ascension	4	9	7.57	Hourly motion	134.94		
Sun's declination	21°	0'	37.4 S.	Hourly motion	0' 26.1	S.	
Moon's declination	20	1	20.4 N.	Hourly motion	9 0.1	N.	
Sun's equa. hor. parallax			8.7	Sun's true semidiameter	16 13.0		
Moon's equa. hor. parallax	56	55.9		Moon's true semidiameter	15 30.0		

TIMES OF THE PHASES.

	Greenwich Mean Time.			Washington Mean Time.		
Moon enters penumbra	November	25	23 15.8	November	25	18 7.6
Moon enters shadow		26	1 25.4		25	20 17.2
Middle of the eclipse		26	1 33.8		25	20 25.6
Moon leaves shadow		26	1 42.1		25	20 33.9
Moon leaves penumbra		26	3 51.7		25	22 43.5

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and in latitude.	
First	12° to W.	155° 48' E.	20° 5' N.
Last	20 to W.	151 50 E.	20 7 N.

Magnitude of the eclipse = 0.005, (moon's diameter = 1).

III.—*A Central Eclipse of the Sun*, 1890, December 11, invisible at Washington.

This eclipse will be annular at the beginning and end; and total between 13^h 55^m.3 and 16^h 20^m.5, Greenwich mean time.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, December 11				^d ^h ^m ^s			
Sun and moon's R. A.	17	16	53.22	Hourly motions	11.03 and 152.85		
Sun's declination	23°	5'	2.3 S.	Hourly motion	0' 11.4	S.	
Moon's declination	23	35	6.0 S.	Hourly motion	5 52.7	S.	
Sun's equa. hor. parallax			8.7	Sun's true semidiameter	16 15.0		
Moon's equa. hor. parallax	59	8.2		Moon's true semidiameter	16 6.1		

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	December 11 12 28.3	77° 49.0' E.	8° 16.4' S.
Central eclipse begins	11 13 32.7	57 0.1 E.	18 37.0 S.
Central eclipse at noon	11 15 14.9	129 42.5 E.	53 58.6 S.
Central eclipse ends	11 16 38.2	142 45.6 W.	36 26.3 S.
Eclipse ends	11 17 42.7	164 59.0 W.	26 25.2 S.

The regions within which the eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, may also be found the Greenwich time of beginning and ending within fifteen or twenty minutes.

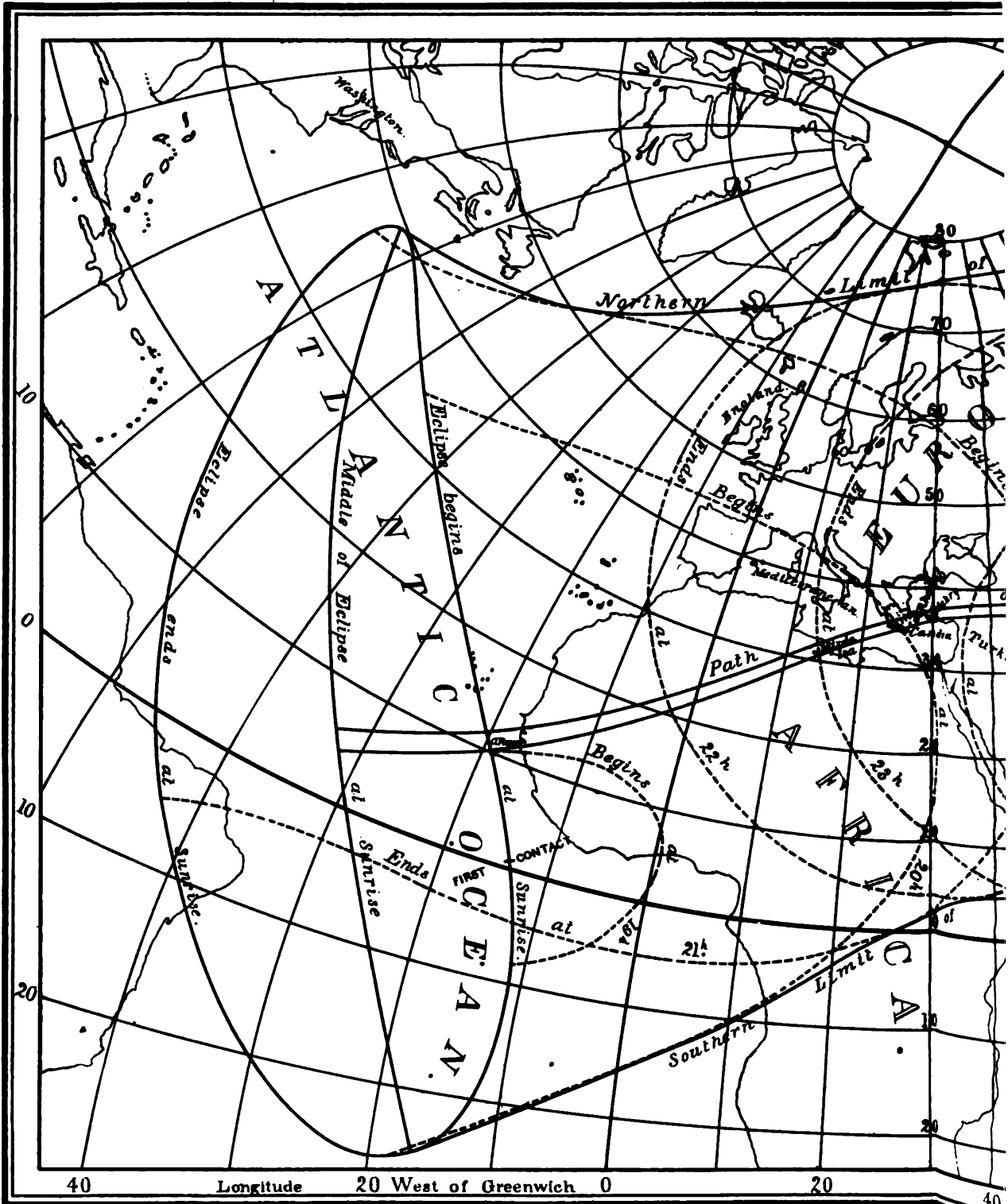
**BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE
OF THE SUN, 1890, JUNE 16-17.**

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.		
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	μ	<i>l</i>	<i>l'</i>	
^h ^m					[°] [']			
18 50	-1.60343	+0.01574	+9.59882	+9.96275	282 21.3	+0.56082	+0.01488	
19 0	-1.51840	+0.02699	+9.59882	+9.96275	284 51.3	+0.56084	+0.01490	
10	1.43336	0.03823	9.59882	9.96275	287 21.3	0.56087	0.01492	
20	1.34832	0.04946	9.59883	9.96275	289 51.3	0.56089	0.01494	
30	1.26327	0.06068	9.59883	9.96275	292 21.3	0.56091	0.01496	
40	1.17822	0.07189	9.59883	9.96275	294 51.3	0.56093	0.01498	
50	1.09317	0.08309	9.59884	9.96275	297 21.2	0.56095	0.01500	
20 0	-1.00812	+0.09429	+9.59884	+9.96275	299 51.2	+0.56097	+0.01502	
10	0.92307	0.10548	9.59884	9.96275	302 21.2	0.56099	0.01504	
20	0.83801	0.11666	9.59885	9.96275	304 51.2	0.56101	0.01506	
30	0.75295	0.12783	9.59885	9.96275	307 21.2	0.56103	0.01508	
40	0.66789	0.13899	9.59885	9.96275	309 51.2	0.56104	0.01510	
50	0.58283	0.15014	9.59886	9.96274	312 21.2	0.56106	0.01512	
21 0	-0.49777	+0.16128	+9.59886	+9.96274	314 51.2	+0.56107	+0.01513	
10	0.41270	0.17241	9.59886	9.96274	317 21.2	0.56109	0.01515	
20	0.32763	0.18353	9.59887	9.96274	319 51.2	0.56110	0.01516	
30	0.24256	0.19464	9.59887	9.96274	322 21.1	0.56112	0.01518	
40	0.15749	0.20575	9.59887	9.96274	324 51.1	0.56113	0.01519	
50	-0.07242	0.21685	9.59887	9.96274	327 21.1	0.56115	0.01520	
22 0	+0.01266	+0.22794	+9.59888	+9.96274	329 51.1	+0.56116	+0.01521	
10	0.09774	0.23902	9.59888	9.96274	332 21.1	0.56117	0.01522	
20	0.18282	0.25009	9.59888	9.96274	334 51.1	0.56118	0.01523	
30	0.26790	0.26115	9.59888	9.96274	337 21.1	0.56119	0.01524	
40	0.35297	0.27220	9.59889	9.96274	339 51.1	0.56120	0.01525	
50	0.43805	0.28325	9.59889	9.96274	342 21.1	0.56121	0.01526	
23 0	+0.52312	+0.29429	+9.59889	+9.96274	344 51.1	+0.56122	+0.01527	
10	0.60820	0.30531	9.59889	9.96274	347 21.1	0.56123	0.01528	
20	0.69327	0.31632	9.59890	9.96274	349 51.0	0.56124	0.01529	
30	0.77835	0.32732	9.59890	9.96274	352 21.0	0.56125	0.01530	
40	0.86342	0.33832	9.59890	9.96273	354 51.0	0.56126	0.01531	
50	0.94849	0.34931	9.59891	9.96273	357 21.0	0.56126	0.01531	
0 0	+1.03356	+0.36029	+9.59891	+9.96273	359 51.0	+0.56127	+0.01532	
10	1.11862	0.37126	9.59891	9.96273	2 21.0	0.56127	0.01532	
20	1.20368	0.38222	9.59892	9.96273	4 51.0	0.56128	0.01533	
30	1.28874	0.39317	9.59892	9.96273	7 21.0	0.56128	0.01533	
40	1.37380	0.40411	9.59892	9.96273	9 51.0	0.56128	0.01533	
50	1.45886	0.41504	9.59893	9.96273	12 21.0	0.56129	0.01534	
1 0	+1.54391	+0.42597	+9.59893	+9.96273	14 50.9	+0.56129	+0.01534	
Greenwich Mean Time.	Log Δx for 1 Minute.		Log Δy for 1 Minute.		Log $\Delta \mu$ for 1 Minute.		Log Tangents of Angles of Cones—	
^h ^m							Penumbra.	Shadow.
18 0	+7.9295	+7.0526	+1.1761	+7.66295	+7.66083			
19 0	7.9296	7.0509	1.1761	7.66295	7.66083			
20 0	7.9297	7.0489	1.1761	7.66294	7.66083			
21 0	7.9298	7.0468	1.1761	7.66294	7.66083			
22 0	7.9298	7.0448	1.1761	7.66294	7.66083			
23 0	7.9298	7.0425	1.1761	7.66294	7.66083			
0 0	7.9298	7.0403	1.1761	7.66294	7.66083			
1 0	+7.9297	+7.0382	+1.1761	+7.66294	+7.66083			

**PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE
OF THE SUN, 1890, JUNE 16-17.**

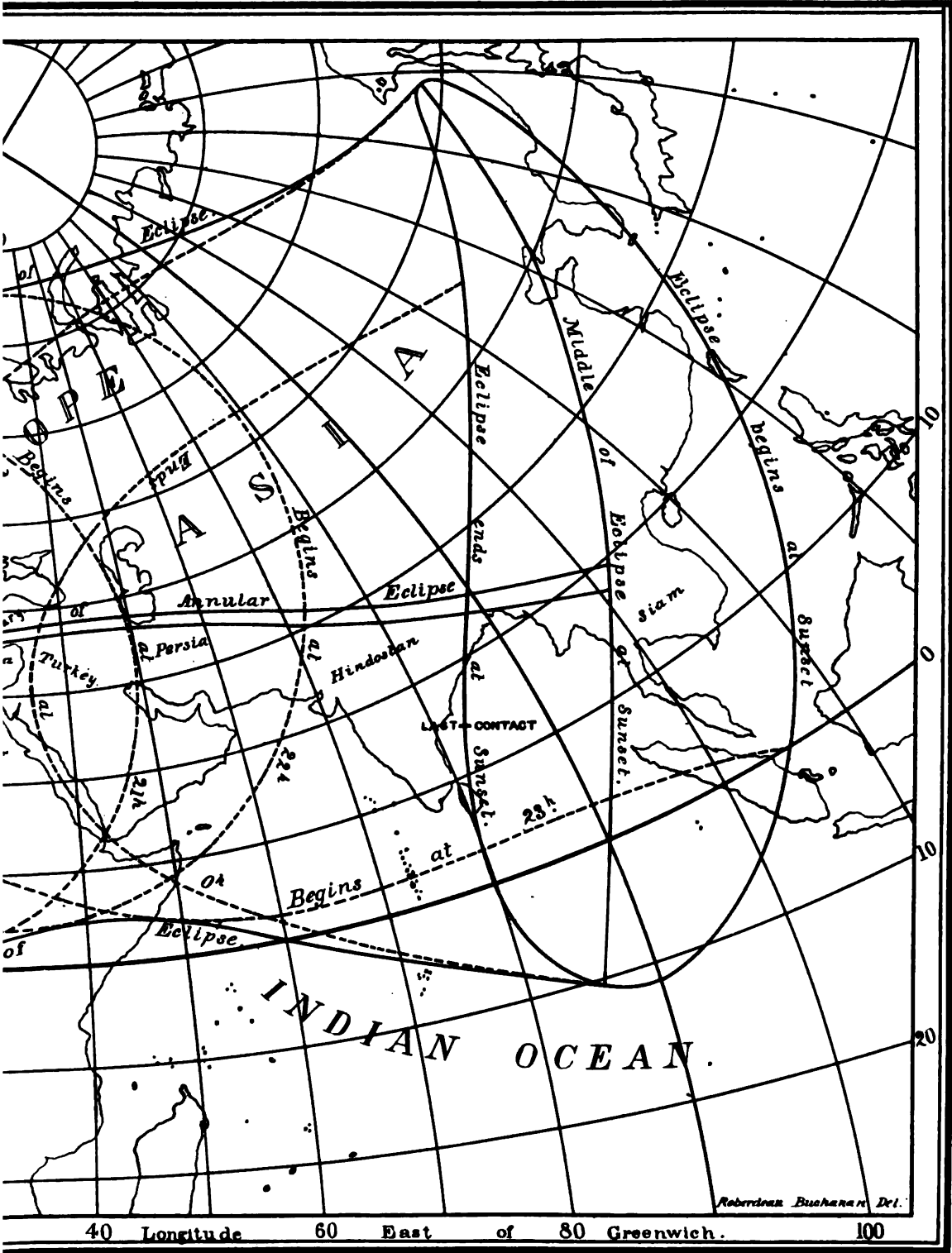
Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits	+ 5 53.8	32 58.4 W.	+ 5 3.9	32 25.5 W.	+ 4 16.1	31 54.0 W.	m s
20 ^h 5 ^m	10 55.8	21 58.6	10 47.9	20 20.4	10 39.9	18 42.2	3 23.5
10	14 30.1	15 39.8	14 11.1	14 30.6	13 52.1	13 21.3	3 27.7
15	17 1.8	11 19.6	16 38.9	10 21.5	16 16.1	9 23.4	3 31.1
20	19 6.6	7 53.3	18 41.6	7 1.8	18 16.6	6 10.2	3 34.2
25	20 54.8	4 57.8	20 28.4	4 10.8	20 2.1	3 23.8	3 37.2
30	+22 31.2	2 21.9	+22 3.8	1 38.4 W.	+21 36.4	0 54.9 W.	3 40.0
35	23 58.9	0 1.3 W.	23 30.6	0 39.4 E.	23 2.3	1 20.0 E.	3 42.7
40	25 19.5	2 9.2 E.	24 50.5	2 47.6	24 21.5	3 25.9	3 45.3
45	26 33.9	4 12.3	26 4.3	4 48.5	25 34.6	5 24.7	3 47.8
50	27 43.0	6 9.8	27 12.7	6 44.1	26 42.5	7 18.4	3 50.2
55	28 47.3	8 2.8	28 16.5	8 35.3	27 45.6	9 7.7	3 52.5
21 0	+29 47.4	9 52.5	+29 16.0	10 23.2	+28 44.6	10 53.9	3 54.8
5	30 43.6	11 39.7	30 11.7	12 8.7	29 39.7	12 37.7	3 57.0
10	31 36.1	13 25.1	31 3.7	13 52.4	30 31.2	14 19.8	3 59.0
15	32 25.2	15 9.3	31 52.2	15 35.0	31 19.2	16 0.7	4 1.0
20	33 10.9	16 52.7	32 37.4	17 16.7	32 3.9	17 40.8	4 2.8
25	33 53.3	18 35.7	33 19.3	18 58.0	32 45.3	19 20.4	4 4.5
30	+34 32.6	20 18.7	+33 58.1	20 39.4	+33 23.6	21 0.0	4 6.0
35	35 8.8	22 2.3	34 33.8	22 21.2	33 58.8	22 40.1	4 7.4
40	35 41.8	23 46.5	35 6.4	24 3.6	34 30.9	24 20.8	4 8.6
45	36 11.8	25 31.5	35 35.9	25 46.8	35 0.0	26 2.1	4 9.6
50	36 38.8	27 17.6	36 2.4	27 30.9	35 26.1	27 44.3	4 10.4
55	37 2.6	29 5.0	36 25.8	29 16.3	35 49.1	29 27.7	4 11.0
22 0	+37 23.3	30 53.8	+36 46.1	31 3.1	+36 9.0	31 12.4	4 11.4
5	37 40.7	32 44.4	37 3.2	32 51.6	36 25.7	32 58.7	4 11.6
10	37 54.9	34 36.8	37 17.1	34 41.8	36 39.2	34 46.8	4 11.6
15	38 5.8	36 31.2	37 27.6	36 33.9	36 49.5	36 36.6	4 11.3
20	38 13.2	38 27.8	37 34.8	38 28.1	36 56.4	38 28.5	4 10.8
25	38 17.1	40 26.7	37 38.5	40 24.7	36 59.8	40 22.7	4 10.1
30	+38 17.2	42 28.3	+37 38.5	42 23.8	+36 59.7	42 19.3	4 9.2
35	38 13.5	44 32.8	37 34.6	44 25.7	36 55.7	44 18.6	4 8.0
40	38 5.8	46 40.5	37 26.9	46 30.7	36 47.9	46 30.8	4 6.6
45	37 53.7	48 51.6	37 14.8	48 39.0	36 35.8	48 26.4	4 5.0
50	37 37.1	51 6.8	36 58.3	50 51.3	36 19.4	50 35.8	4 3.1
55	37 15.9	53 26.6	36 37.2	53 8.1	35 58.5	52 49.6	4 1.2
23 0	+36 49.5	55 51.5	+36 11.0	55 29.9	+35 32.5	55 8.2	3 59.0
5	36 17.2	58 22.4	35 39.0	57 57.4	35 0.9	57 32.4	3 56.7
10	35 38.5	61 0.5	35 0.8	60 32.0	34 23.1	60 3.4	3 54.1
15	34 52.4	63 48.0	34 15.3	63 15.6	33 38.2	62 43.3	3 51.4
20	33 58.0	66 46.8	33 21.8	66 10.1	32 45.5	65 33.4	3 48.5
25	32 53.3	70 1.2	32 18.1	69 19.5	31 43.0	68 37.9	3 45.3
30	+31 35.3	73 36.9	+31 1.7	72 49.0	+30 28.2	72 1.1	3 41.9
35	29 59.1	77 44.8	29 28.0	76 48.6	28 56.9	75 52.4	3 38.3
40	27 54.2	82 47.6	27 27.5	81 38.4	27 0.8	80 29.2	3 34.1
45	24 46.7	90 1.3	24 32.1	88 20.8	24 17.5	86 40.4	3 29.0
Limits	+19 32.2	101 59.6 E.	+18 43.2	101 25.8 E.	+17 53.7	100 49.3 E.	

ANNULAR ECLIPSE



Note.—The hours of beginning and ending are expressed in

E OF JUNE 16-17TH 1890.



expressed in Greenwich Mean Time.

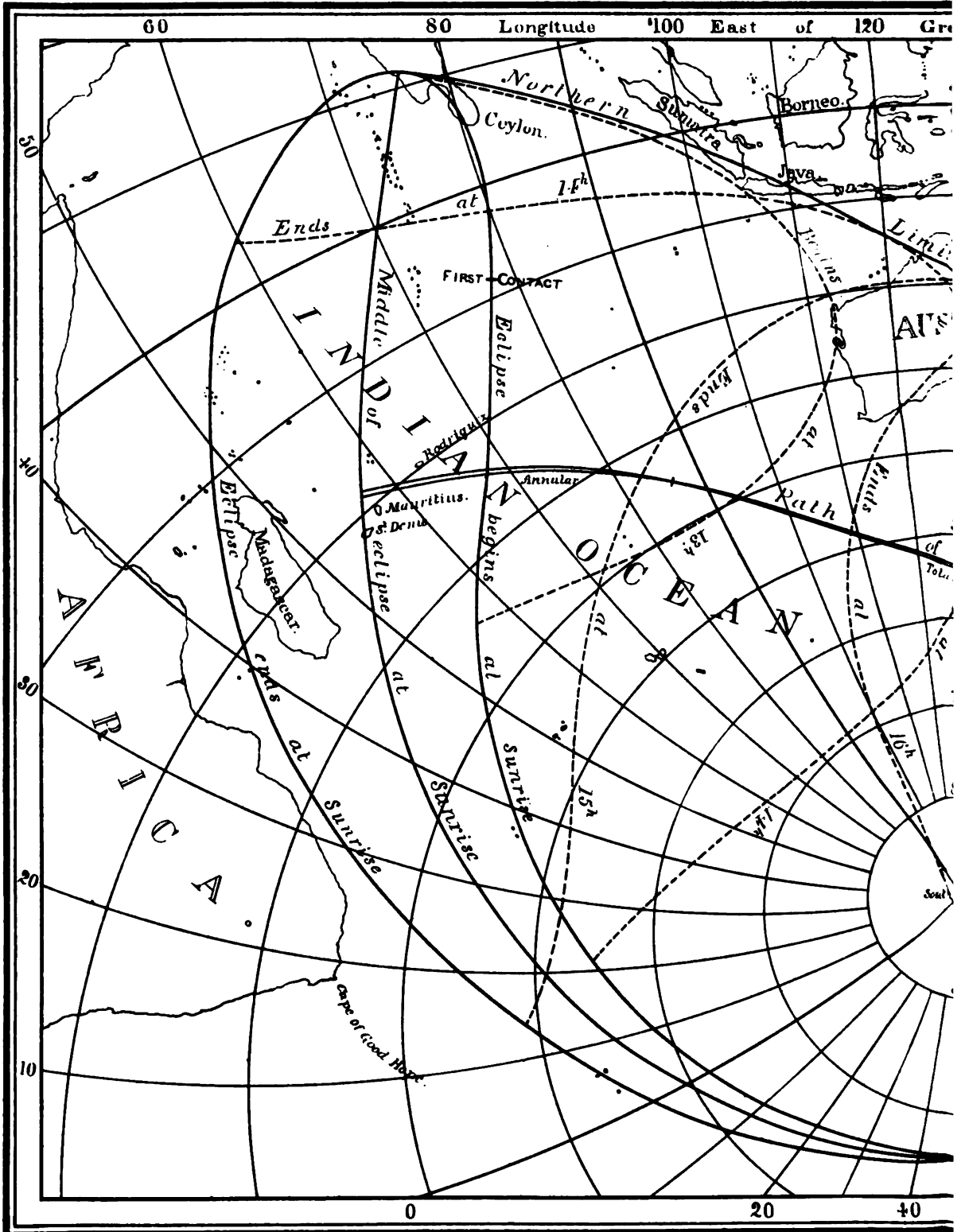
**BESSELIAN ELEMENTS OF THE CENTRAL ECLIPSE
OF THE SUN, 1890, DECEMBER 11.**

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	μ	<i>l</i>	<i>l'</i>
^h ^m							
12 20	-1.60552	-0.22745	-9.59320	+9.96379	186° 33.9	+0.54866	+0.00277
30	1.51379	0.24367	9.59321	9.96379	189 3.9	0.54865	0.00276
40	1.42205	0.25988	9.59322	9.96378	191 33.9	0.54864	0.00275
50	1.33031	0.27607	9.59322	9.96378	194 3.8	0.54863	0.00274
13 0	-1.23856	-0.29225	-9.59323	+9.96378	196 33.8	+0.54862	+0.00273
10	1.14681	0.30842	9.59324	9.96378	199 3.8	0.54861	0.00272
20	1.05505	0.32458	9.59325	9.96378	201 33.7	0.54860	0.00271
30	0.96329	0.34073	9.59326	9.96378	204 3.7	0.54859	0.00270
40	0.87152	0.35688	9.59327	9.96377	206 33.6	0.54858	0.00269
50	0.77974	0.37302	9.59328	9.96377	209 3.6	0.54857	0.00268
14 0	-0.68796	-0.38915	-9.59328	+9.96377	211 33.6	+0.54855	+0.00266
10	0.59617	0.40526	9.59329	9.96377	214 3.5	0.54853	0.00265
20	0.50438	0.42136	9.59330	9.96377	216 33.5	0.54852	0.00264
30	0.41259	0.43745	9.59331	9.96377	219 3.5	0.54850	0.00262
40	0.32079	0.45353	9.59332	9.96376	221 33.4	0.54848	0.00261
50	0.22899	0.46960	9.59333	9.96376	224 3.4	0.54847	0.00259
15 0	-0.13719	-0.48565	-9.59334	+9.96376	226 33.4	+0.54845	+0.00257
10	-0.04538	0.50169	9.59335	9.96376	229 3.3	0.54843	0.00255
20	+0.04643	0.51772	9.59336	9.96376	231 33.3	0.54841	0.00253
30	0.13824	0.53375	9.59336	9.96376	234 3.3	0.54839	0.00251
40	0.23005	0.54977	9.59337	9.96375	236 33.2	0.54837	0.00249
50	0.32186	0.56578	9.59338	9.96375	239 3.2	0.54835	0.00247
16 0	+0.11367	-0.58178	-9.59339	+9.96375	241 33.2	+0.54833	+0.00245
10	0.50519	0.59777	9.59340	9.96375	241 3.1	0.54831	0.00243
20	0.59731	0.61371	9.59341	9.96375	246 33.1	0.54829	0.00241
30	0.68913	0.62970	9.59342	9.96375	249 3.1	0.54827	0.00238
40	0.78095	0.64565	9.59343	9.96375	251 33.0	0.54824	0.00236
50	0.87277	0.66159	9.59343	9.96374	254 3.0	0.54822	0.00233
17 0	+0.96160	-0.67752	-9.59344	+9.96374	256 33.0	+0.54819	+0.00230
10	1.05642	0.69313	9.59345	9.96374	259 2.9	0.54817	0.00228
20	1.14824	0.70933	9.59346	9.96374	261 32.9	0.54814	0.00226
30	1.24006	0.72522	9.59347	9.96374	264 2.9	0.54811	0.00223
40	1.33188	0.74110	9.59348	9.96374	266 32.8	0.54808	0.00220
50	+1.42369	-0.75697	-9.59349	+9.96373	269 2.8	+0.54805	+0.00217
Greenwich Mean Time.	Log Δx for 1 Minute.	Log Δy for 1 Minute.	Log $\Delta \mu$ for 1 Minute.	Log Tangents of Angles of Cones—			
^h ^m				Penumbra.	Shadow.		
12 0	+7.9625	-7.2107	+1.1760	+7.67672	+7.67461		
13 0	7.9626	7.2090	1.1760	7.67672	7.67461		
14 0	7.9628	7.2073	1.1760	7.67672	7.67461		
15 0	7.9629	7.2056	1.1760	7.67673	7.67461		
16 0	7.9629	7.2039	1.1760	7.67673	7.67462		
17 0	7.9629	7.2020	1.1760	7.67673	7.67462		
18 0	+7.9629	-7.2000	+1.1760	+7.67673	+7.67462		

**PATH OF THE ANNULUS AND SHADOW DURING THE CENTRAL ECLIPSE
OF THE SUN, 1890, DECEMBER 11.**

Greenwich Mean Time.	Northern Limit of Annulus and Southern Limit of Umbral Path.		Central Line.		Southern Limit of Annulus and Northern Limit of Umbral Path.		Duration of Annulus or Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits	$-18^{\circ} 26.6$	$57^{\circ} 8.9$ E.	$-18^{\circ} 37.0$	$57^{\circ} 0.1$ E.	$-18^{\circ} 46.2$	$56^{\circ} 53.2$ E.	m s
13^h 35^m	23 21.7	67 23.0	23 24.7	66 59.7	23 27.7	66 36.4	0 22.5
40	27 30.7	74 28.4	27 31.2	74 19.2	27 31.7	74 10.1	0 14.7
45	30 25.4	79 10.6	30 26.2	79 6.0	30 26.9	79 1.5	0 9.1
50	32 51.2	82 56.6	32 51.7	82 54.7	32 52.1	82 52.9	0 4.3
55	34 59.4	86 12.5	34 59.4	86 12.4	34 59.5	86 12.4	0 0.2
14 0	-36 55.4	89 10.0	-36 54.9	89 11.2	-36 54.4	89 12.5	0 3.5
5	38 42.0	91 55.0	38 41.0	91 57.3	38 40.0	91 59.7	0 6.9
10	40 21.1	94 32.9	40 19.6	94 36.0	40 18.1	94 39.2	0 9.9
15	41 53.5	97 5.4	41 51.5	97 9.2	41 49.5	97 13.0	0 12.7
20	43 20.3	99 35.3	43 17.8	99 39.5	43 15.3	99 43.8	0 15.2
25	44 41.9	102 4.1	44 38.9	102 8.7	44 35.9	102 13.4	0 17.5
30	-45 58.7	104 33.3	-45 55.2	104 38.2	-45 51.8	104 43.1	0 19.5
35	47 10.8	107 4.1	47 7.0	107 9.1	47 3.1	107 14.1	0 21.3
40	48 18.6	109 37.5	48 14.3	109 42.5	48 10.0	109 47.5	0 22.8
45	49 22.0	112 14.5	49 17.3	112 19.4	49 12.7	112 24.3	0 24.1
50	50 20.9	114 55.6	50 15.9	115 0.3	50 10.9	115 5.0	0 25.2
55	51 15.2	117 41.4	51 10.0	117 45.8	51 4.7	117 50.2	0 26.0
15 0	-52 4.9	120 32.5	-51 59.4	120 36.4	-51 53.9	120 40.4	0 26.6
5	52 50.0	123 29.4	52 44.2	123 32.8	52 38.5	123 36.2	0 27.0
10	53 30.0	126 32.5	53 24.1	126 35.3	53 18.3	126 38.1	0 27.1
15	54 4.9	129 42.6	53 58.9	129 44.7	53 53.0	129 46.8	0 26.9
20	54 34.2	132 59.7	54 28.2	133 1.0	54 22.3	133 2.4	0 26.5
25	54 57.7	136 23.8	54 51.8	136 24.4	54 45.9	136 24.9	0 25.8
30	-55 14.9	139 55.2	-55 9.2	139 54.9	-55 3.5	139 54.6	0 24.9
35	55 25.5	143 33.6	55 20.1	143 32.5	55 14.6	143 31.4	0 23.7
40	55 29.1	147 19.1	55 23.9	147 17.3	55 18.7	147 15.4	0 22.3
45	55 25.2	151 11.6	55 20.4	151 9.2	55 15.5	151 6.7	0 20.6
50	55 13.0	155 11.1	55 8.7	155 8.1	55 4.4	155 5.1	0 18.6
55	54 51.8	159 17.8	54 48.1	159 14.5	54 44.3	159 11.1	0 16.3
16 0	-54 21.1	163 32.1	-54 18.0	163 28.7	-54 14.9	163 25.2	0 13.8
5	53 40.2	167 55.3	53 37.8	167 52.0	53 35.4	167 48.7	0 11.0
10	52 47.6	172 28.3	52 46.0	172 25.5	52 44.4	172 22.7	0 7.9
15	51 40.7	177 14.6 E.	51 39.8	177 12.8 E.	51 39.0	177 11.0 E.	0 4.4
20	50 16.7	177 40.1 W.	50 16.6	177 40.3 W.	50 16.6	177 40.5 W.	0 0.4
25	48 30.5	172 6.1	48 31.1	172 3.8	48 31.7	172 1.5	0 4.1
30	-46 10.0	165 39.6	-46 10.9	165 33.0	-46 11.8	165 26.3	0 9.4
35	42 39.4	157 8.9	42 40.3	156 50.9	42 41.2	156 33.0	0 16.6
Limits	-36 16.0	142 57.6 W.	-36 26.3	142 45.6 W.	-36 32.4	142 40.7 W.	

CENTRAL ECLIPSE



Note.—The hours of beginning and ending.

all are expressed in Greenwich Mean Time.

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.			First Quarter.			Full Moon.			Last Quarter.						
	d	h	m		d	h	m		d	h	m		d	h	m
January	20	6	40.8	January	27	3	8.2	January	5	12	28.6	January	13	13	24.5
February	18	17	19.5	February	25	20	58.2	February	4	8	5.3	February	12	1	43.2
March	20	3	53.2	March	27	16	24.4	March	6	1	39.2	March	13	10	56.5
April	18	14	57.4	April	26	11	43.3	April	4	16	16.3	April	11	17	45.0
May	18	3	10.3	May	26	5	25.7	May	4	4	0.7	May	10	23	13.4
June	16	16	49.5	June	24	20	45.4	June	2	13	26.0	June	9	4	41.7
July	16	7	41.3	July	24	9	35.8	July	1	21	15.0	July	8	11	34.9
August	14	23	11.4	August	22	20	11.5	August	31	4	16.3	August	6	21	10.5
September	13	14	44.8	September	21	4	57.2	August	29	11	26.8	September	5	10	21.2
October	13	5	56.8	September	20	12	28.3	September	27	19	51.5	October	5	3	15.1
November	11	20	29.4	October	18	19	36.4	October	27	6	33.7	November	3	23	4.8
December	11	10	2.7	November	18	3	28.1	November	25	20	14.6	December	3	20	18.4
				December	18	3	28.1	December	25	12	48.8				

PERIGEE, APOGEE, AND GREATEST LIBRATION.

Apogee.		Perigee.		Greatest Libration.			
	d h		d h		d h m		d h m
January	5 18.9	January	19 21.6	January	13 18 28 E.	January	25 19 11 W.
February	1 21.1	February	17 8.5	February	10 18 59 E.	February	23 3 21 W.
March	1 10.5	March	17 9.8	March	9 20 23 E.	March	23 4 24 W.
March	29 4.6	April	13 0.0	April	5 1 15 E.	April	19 16 33 W.
April	26 0.9	May	8 5.3	May	2 3 33 E.	May	16 7 3 W.
May	23 19.1	June	4 17.0	May	29 21 53 E.	June	11 17 50 W.
June	20 10.3	July	2 21.3	June	26 23 55 E.	July	9 7 14 W.
July	17 20.7	July	31 6.3	July	25 4 54 E.	August	6 8 53 W.
August	13 23.2	August	28 16.3	August	22 8 44 E.	September	3 14 0 W.
September	10 6.2	September	25 22.7	September	19 1 53 E.	October	1 17 50 W.
October	7 20.9	October	23 16.9	October	15 15 48 E.	October	29 14 45 W.
November	4 16.1	November	18 0.9	November	11 2 0 E.	November	25 19 8 W.
December	2 13.3	December	14 7.5	December	8 13 9 E.	December	22 0 0 W.
December	30 8.9						

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I , the inclination of the moon's equator to the ecliptic ($= 1^\circ 28'.8$),

Ω , the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C , the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, \alpha', \delta'$, the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ' , the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω ,

$i, \Delta, \Omega', \mathcal{C}$, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277:—

$$\left. \begin{aligned} \Delta \lambda &= -0.57 \sin 2(\Omega - \lambda) \\ \alpha &= \sin I \cos (\Omega - \lambda) \\ \tan B &= \tan I \sin (\Omega - \lambda) \\ \lambda' &= \lambda + \Delta \lambda + \alpha b \end{aligned} \right\} \text{See table, page 277.}$$

The libration in latitude $= b = B - \beta$

The libration in longitude $= l = \lambda' - \mathcal{C}$

$$\sin C = \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta'} = - \sin i \frac{\cos (\alpha' - \Omega)}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	α'	γ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 1119	6	-0.15	-3.0	+16 10.7	1 5 34.3	- 3 12.8	-0.4135	0.5276	+0.1707	+17°	-57°
B. A. C. 1206	6	0.10	1.8	16 59.9	12 21.9	+ 3 22.2	-0.1810	0.5295	0.1622	+29	-41
B. A. C. 1240	6	0.07	1.4	17 53.0	16 7.2	+ 7 0.5	-0.5558	0.5303	0.1566	+ 9	-64
B. A. C. 1272	6	-0.04	1.6	17 2.7	19 40.2	+10 26.7	+0.9122	0.5322	0.1514	+90	+20
NEPTUNE				18 57.5	19 42.1	+10 28.7	-1.1850	0.5327	0.1517	-36	-71
ϵ Tauri	3 $\frac{1}{2}$	+0.03	-1.3	+18 56.2	2 5 41.3	- 3 50.8	+0.2715	0.5351	+0.1358	+56	-14
W. iv, 650	6	0.06	0.9	20 27.8	10 19.9	+ 0 38.7	-0.7978	0.5366	0.1287	- 6	-70
ι Tauri	5	0.13	0.9	21 25.9	22 13.2	-11 50.5	-0.4623	0.5399	0.1079	+14	-52
ι Tauri	5 $\frac{1}{2}$	0.16	1.0	20 16.4	3 0 29.9	- 9 38.2	+1.0590	0.5407	0.1035	+90	+37
105 Tauri	6	0.15	0.8	21 33.6	0 31.2	- 9 36.9	-0.3610	0.5407	0.1035	+19	-45
108 Tauri	6 $\frac{1}{2}$	+0.17	-0.8	+22 9.6	4 5.4	- 6 9.7	-0.6755	0.5423	+0.0975	+ 2	-65
α Tauri	5 $\frac{1}{2}$	0.18	0.8	21 59.0	5 54.0	- 4 24.7	-0.2989	0.5428	0.0939	+23	-40
α Tauri	6	0.20	0.8	21 50.5	9 51.3	- 0 35.0	+0.2159	0.5436	0.0863	+53	-11
B. A. C. 1801	6	0.23	0.8	23 9.2	17 12.5	+ 6 31.9	-0.6563	0.5458	0.0724	+ 2	-63
141 Tauri	6 $\frac{1}{2}$	0.24	0.9	22 23.9	4 1 49.4	- 9 8.4	+0.7319	0.5466	0.0553	+90	+20
1 Geminorum	5	+0.25	-0.9	+23 16.1	2 56.2	- 8 3.7	-0.1738	0.5467	+0.0529	+30	-29
2 Geminorum	7	0.29	0.7	23 38.8	4 10.9	- 6 51.5	-0.5268	0.5470	0.0503	+10	-51
3 Geminorum	6 $\frac{1}{2}$	0.30	0.6	23 7.8	5 33.4	- 5 31.7	+0.1148	0.5479	0.0478	+46	-13
6 Geminorum	6 $\frac{1}{2}$	0.30	0.9	22 55.9	6 46.0	- 4 21.6	+0.3907	0.5482	0.0451	+65	+ 2
η Geminorum	3 $\frac{1}{2}$	0.29	1.0	22 32.3	7 58.3	- 3 11.6	+0.8778	0.5483	0.0430	+90	+30
9 Geminorum	6 $\frac{1}{2}$	+0.30	-0.9	+23 46.7	8 54.0	- 2 17.8	-0.4593	0.5484	+0.0410	+14	-45
μ Geminorum	3	0.29	1.0	22 34.2	11 43.4	+ 0 26.0	+0.9891	0.5484	+0.0352	+90	+38
ω Geminorum	5 $\frac{1}{2}$	0.29	1.2	24 22.2	5 6 0.1	- 5 53.7	-0.7131	0.5487	-0.0028	- 2	-64
44 Geminorum	6	0.36	1.4	22 48.1	7 22.8	- 4 33.7	+1.0240	0.5484	0.0055	+90	+44
48 Geminorum	6	0.34	1.4	24 18.8	10 39.5	- 1 23.6	-0.6871	0.5480	0.0122	0	-62
58 Geminorum	6 $\frac{1}{2}$	+0.35	-1.6	+23 9.3	15 48.9	+ 3 35.5	+0.5112	0.5478	-0.0231	+75	+11
82 Geminorum	6 $\frac{1}{2}$	0.35	1.8	23 24.7	6 30.9	- 9 5.6	-0.1852	0.5464	0.0470	+29	-29
84 Geminorum	6 $\frac{1}{2}$	0.34	1.9	22 36.9	5 37.2	- 7 3.5	+0.5964	0.5460	0.0511	+83	+12
7 Cancri	6 $\frac{1}{2}$	0.30	1.8	22 22.7	10 42.8	- 2 7.8	+0.5723	0.5453	0.0613	+81	+10
μ Cancri	6 $\frac{1}{2}$	0.33	1.7	22 57.0	11 51.5	- 1 1.5	-0.1352	0.5450	0.0638	+32	-28
μ^2 Cancri	5 $\frac{1}{2}$	+0.32	-1.7	+21 54.1	12 33.9	- 0 20.5	+0.9833	0.5449	-0.0648	+90	+35
γ Cancri	4 $\frac{1}{2}$	0.28	2.0	21 51.9	7 5 26.7	- 8 0.5	-0.3463	0.5408	0.0972	+20	-44
B. A. C. 3206	6 $\frac{1}{2}$	0.19	2.2	20 15.8	8 1 24.3	+11 18.7	-0.5525	0.5336	0.1314	- 9	-70
η Leonis	3 $\frac{1}{2}$	0.04	1.7	17 17.9	22 45.1	+ 8 0.3	-0.7206	0.5264	0.1626	0	-73
42 Leonis	6	+0.01	1.9	15 31.8	9 6 6.5	- 8 51.6	-0.0037	0.5244	0.1722	+39	-33
ι Leonis	5 $\frac{1}{2}$	-0.02	-1.4	+14 42.0	11 23.0	- 3 44.7	-0.0164	0.5226	-0.1784	+39	-34
ι Leonis <i>mult.</i>	4	0.04	-0.7	11 8.1	10 14 5.4	- 1 49.8	-1.2480	0.5158	0.2040	-39	-79
ω Virginis	6	0.06	0.0	8 44.6	21 41.4	+ 5 32.8	-0.2228	0.5154	0.2109	+28	-50
ξ Virginis	5 $\frac{1}{2}$	0.32	0.0	8 52.2	11 1 15.0	+ 9 0.2	-1.1130	0.5151	0.2131	-25	-81
ν Virginis	4	0.33	+0.5	7 8.8	1 33.5	+ 9 18.3	+0.6907	0.5148	0.2134	+89	- 1
π Virginis	4 $\frac{1}{2}$	-0.41	+0.7	+ 7 13.6	9 24.2	- 7 4.8	-1.0880	0.5146	-0.2180	-23	-83
11 Virginis	6	0.46	0.9	6 25.2	14 12.8	- 2 24.7	-1.2700	0.5150	0.2206	-39	-84
ϵ Virginis	5 $\frac{1}{2}$	0.50	1.7	3 55.6	19 35.5	+ 2 48.5	+0.2261	0.5157	0.2231	+53	-27
B. A. C. 4254	6	0.60	1.9	+ 2 27.8	12 4 56.7	+11 53.3	-0.3072	0.5165	0.2263	+23	-57
20 Virginis	6	0.91	4.0	- 4 50.0	13 10 3.4	- 7 52.2	+0.8084	0.5258	0.2278	+35	+ 4
88 Virginis	6 $\frac{1}{2}$	-0.98	+4.4	- 6 17.2	16 23.6	- 1 43.7	+0.8950	0.5287	-0.2258	+84	+ 9
94 Virginis	6 $\frac{1}{2}$	1.07	4.8	8 21.9	14 1 10.4	+ 6 46.5	+1.0950	0.5341	0.2230	+82	+24
ζ^1 Libræ	6	1.37	5.0	11 26.9	23 47.2	+ 4 39.2	-0.5903	0.5483	0.2065	+ 5	-79
α^1 Libræ	6 $\frac{1}{2}$	1.51	5.6	15 8.9	15 11 41.3	- 7 51.3	+0.8095	0.5593	0.1941	+75	+ 5
α^2 Libræ	6 $\frac{1}{2}$	1.53	5.2	14 44.4	12 34.8	- 6 59.6	+0.2211	0.5605	0.1929	+46	-27
ζ^2 Libræ	6	-1.59	+4.8	-16 13.7	15 54.0	- 3 47.5	+1.1020	0.5628	-0.1884	+74	+26
ζ^3 Libræ	5 $\frac{1}{2}$	1.68	4.5	16 28.6	16 52.5	- 2 51.0	+1.1710	0.5640	0.1872	+74	+32
γ Libræ	4 $\frac{1}{2}$	1.60	4.8	14 25.2	18 1.9	- 1 44.1	-1.1360	0.5655	0.1856	-39	-90
η Libræ	6	1.66	4.8	15 19.1	21 41.8	+ 1 47.8	-0.8919	0.5683	0.1803	-17	-90
θ Libræ	4 $\frac{1}{2}$	1.73	4.9	16 24.3	16 1 48.9	+ 5 45.9	-0.5184	0.5712	0.1736	+ 4	-73
49 Libræ	6	-1.75	+4.2	-16 12.4	4 35.1	+ 8 26.0	-1.1930	0.5741	-0.1694	-42	-90
ν^2 Scorpii	4 $\frac{1}{2}$	-1.80	+4.9	-19 10.4	9 20.9	-10 53.8	+1.0100	0.5785	-0.1613	+71	+20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1800.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
ψ Ophiuchi	4 $\frac{1}{2}$	-1.87	+ 4.6	-19 46.7	16 14 17.4	- 6 13.6	+0.8395	0.5831	-0.1522	+70	+ 8
γ Ophiuchi	4 $\frac{1}{2}$	1.87	4.1	18 12.3	15 30.0	- 5 3.7	-0.9196	0.5853	0.1496	-23	-90
ξ Ophiuchi	5	2.11	2.4	20 59.5	17 12 36.7	- 5 47.3	-0.8116	0.6032	0.1016	-21	-90
58 Ophiuchi	4 $\frac{1}{2}$	2.20	1.4	21 37.8	21 5.1	- 0 40.0	-0.9504	0.6098	0.0805	-32	-90
4 Sagittarii	5 $\frac{1}{2}$	2.26	1.0	23 48.3	18 3 7.6	+ 5 7.2	+0.7601	0.6130	0.0636	+66	+ 4
7 Sagittarii	6	-2.24	+ 0.9	-24 16.8	4 14.8	+ 6 11.6	+1.1600	0.6139	-0.0604	+66	+37
P. xvii, 330	5 $\frac{1}{2}$	2.26	0.7	23 8.4	4 33.4	+ 6 29.5	+0.0198	0.6141	0.0593	+21	-38
9 Sagittarii	6	2.28	0.9	24 21.8	4 37.5	+ 6 33.4	+1.2200	0.6141	0.0593	+66	+45
P. xvii, 334	5 $\frac{1}{2}$	2.26	0.6	22 50.5	4 40.3	+ 6 36.0	-0.2824	0.6141	0.0592	+ 6	-57
B. A. C. 6161	5 $\frac{1}{2}$	2.39	+ 0.3	23 43.5	7 31.4	+ 9 19.8	+0.4311	0.6152	-0.0512	+44	-15
VENUS				-22 5.9	19 18 32.6	- 5 9.9	-1.1290	0.5708	+0.0465	-48	-90
NEW MOON.											
ϕ Capricorni	5 $\frac{1}{2}$	-2.24	- 9.6	21 6.6	21 2 42.8	+ 1 38.3	+1.0720	0.6032	0.1397	+69	+26
ϵ Capricorni	4 $\frac{1}{2}$	2.17	10.5	19 57.7	11 18.2	+ 9 53.2	+1.2340	0.5968	0.1588	+70	+42
κ Capricorni	5	-2.15	-10.8	-19 22.2	13 29.5	+11 59.3	+1.0030	0.5943	+0.1631	+71	+19
29 Aquarii <i>mult</i>	6 $\frac{1}{2}$	2.06	11.3	17 29.8	21 23.0	- 4 25.9	+0.5082	0.5878	0.1782	+61	-12
50 Aquarii	6	1.96	11.4	14 5.4	22 6 23.0	+ 4 13.4	-1.1900	0.5807	0.1934	-39	-90
56 Aquarii	6 $\frac{1}{2}$	1.84	11.7	15 9.0	8 47.6	+ 6 32.6	+0.3328	0.5793	0.1968	+52	-22
τ Aquarii	4	1.83	11.8	14 10.6	16 55.4	- 9 37.6	+1.0130	0.5718	0.2077	+76	+21
74 Aquarii	6	-1.83	-11.8	-12 12.3	18 35.4	- 8 1.3	-0.6088	0.5701	+0.2096	+ 3	-81
ψ Aquarii	4	1.72	11.7	9 41.4	23 4 17.8	+ 1 20.3	-1.0450	0.5619	0.2195	-23	-90
ψ Aquarii	4	1.71	11.7	9 47.2	5 11.9	+ 2 12.5	-0.7521	0.5622	0.2205	- 5	-90
ψ Aquarii	4 $\frac{1}{2}$	1.71	11.8	10 12.9	5 39.8	+ 2 39.5	-0.2178	0.5618	0.2208	+25	-52
B. A. C. 8274	7	1.56	11.3	6 59.7	18 56.7	- 8 31.2	-0.4713	0.5527	0.2298	+13	-69
30 Piscium	4 $\frac{1}{2}$	-1.51	-11.7	- 6 37.8	24 1 6.4	- 2 33.8	+0.5797	0.5473	+0.2324	+75	- 9
33 Piscium	5	1.51	11.6	6 19.6	2 40.6	- 1 2.8	+0.6383	0.5464	0.2331	+80	- 6
B. A. C. 17	6	1.46	11.4	5 51.2	4 59.5	+ 1 11.5	+0.6971	0.5453	0.2338	+84	- 2
15 Ceti	6 $\frac{1}{2}$	1.32	9.9	1 6.8	18 6.9	-10 6.8	-1.0790	0.5374	0.2356	-22	-90
20 Ceti	5	1.26	10.4	- 1 44.7	23 1 18.3	- 3 9.0	+1.2680	0.5341	0.2352	+88	+39
26 Ceti	6	-1.20	- 9.2	+ 0 46.4	6 32.6	+ 1 55.3	-0.1109	0.5327	+0.2345	+34	-45
29 Ceti	6 $\frac{1}{2}$	1.18	9.1	1 24.9	8 34.7	+ 3 53.6	-0.3033	0.5313	0.2337	+32	-57
33 Ceti	6	1.17	8.8	1 51.5	9 50.4	+ 5 6.9	-0.4687	0.5313	0.2335	+15	-68
35 Ceti	6 $\frac{1}{2}$	1.15	9.0	1 53.2	10 48.3	+ 6 3.0	-0.2743	0.5305	0.2331	+25	-56
f Piscium	5	1.13	8.5	3 2.0	13 23.4	+ 8 33.3	-0.8678	0.5297	0.2322	- 8	-87
ν Piscium	4 $\frac{1}{2}$	-1.02	- 8.0	+ 4 55.7	26 1 3.7	- 4 8.1	-0.1755	0.5274	+0.2272	+30	-48
64 Ceti	5 $\frac{1}{2}$	0.85	6.5	8 3.2	15 58.2	+10 19.1	-0.1646	0.5246	0.2172	+31	-47
ξ Ceti	4 $\frac{1}{2}$	0.84	6.3	8 19.7	16 47.1	+11 6.4	-0.2796	0.5243	0.2165	+25	-53
ξ Arietis	5 $\frac{1}{2}$	0.78	5.5	10 6.6	22 40.7	- 7 10.7	-0.9147	0.5240	0.2117	-11	-80
B. A. C. 755	6 $\frac{1}{2}$	0.77	5.4	10 4.0	23 39.2	- 6 14.1	-0.6637	0.5247	0.2110	+ 4	-78
B. A. C. 830	6	-0.71	- 5.3	+10 16.2	27 7 31.8	+ 1 24.2	+0.7518	0.5247	+0.2036	+90	+ 5
38 Arietis	5	0.69	4.6	11 58.9	8 44.3	+ 2 34.4	-0.8373	0.5248	0.2026	- 7	-78
Lalande 5725	6	0.58	4.1	12 45.9	19 26.9	-11 2.6	+0.4280	0.5254	0.1908	+66	-12
B. A. C. 1119	6	0.42	2.6	16 10.7	28 11 47.7	+ 4 48.1	-0.3061	0.5280	0.1706	+23	-50
B. A. C. 1206	6	0.34	2.3	16 59.9	18 32.6	+11 20.4	-0.0818	0.5288	0.1610	+35	-35
B. A. C. 1240	6	-0.30	- 1.8	+17 53.0	22 16.9	- 9 2.3	-0.4536	0.5307	+0.1563	+15	-57
NEPTUNE				18 54.4	29 1 4.4	- 6 20.0	-1.1440	0.5308	0.1518	-31	-71
B. A. C. 1272	6	0.28	1.9	17 2.7	1 48.9	- 5 36.9	+1.0040	0.5308	0.1505	+90	+27
ϵ Tauri	3 $\frac{1}{2}$	0.18	1.4	18 56.2	11 48.4	+ 4 3.7	+0.3638	0.5338	0.1349	+62	- 9
W. iv., 650	6	0.13	0.8	20 27.2	16 26.5	+ 8 33.0	-0.6942	0.5351	0.1274	0	-85
ϵ Tauri	5	-0.02	- 0.5	+21 25.9	30 4 19.9	- 3 56.4	-0.3806	0.5382	+0.1072	+18	-46
ζ Tauri	5 $\frac{1}{2}$	0.30	0.8	20 16.4	6 36.7	- 1 44.0	+1.1365	0.5388	0.1026	+90	+44
105 Tauri	6	+ 0.1	0.5	21 33.6	6 38.1	- 1 42.6	-0.2813	0.5388	0.1026	+24	-40
108 Tauri	6 $\frac{1}{2}$	0.03	0.2	22 9.6	10 12.5	+ 1 44.9	-0.5893	0.5403	0.0965	+ 6	-60
κ Tauri	5 $\frac{1}{2}$	0.05	0.3	21 59.0	12 1.3	+ 3 30.1	-0.2210	0.5404	0.0929	+27	-36
σ Tauri	6	+0.10	- 0.3	+21 50.5	15 59.1	+ 7 20.2	+0.2878	0.5420	+0.0857	+57	- 8
B. A. C. 1801	6	+0.17	- 0.2	+23 9.2	23 21.4	- 9 31.8	-0.5868	0.5432	+0.0721	+ 6	-57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N	S	
		$\Delta\alpha$	$\Delta\delta$									
		$\overset{s}{\Delta\alpha}$	$\overset{o}{\Delta\delta}$	$\overset{o}{}$	$\overset{d}{}$	$\overset{h}{}$	$\overset{m}{}$	$\overset{s}{}$				
141 Tauri	6 $\frac{1}{2}$	+0.25	-0.4	+22 23.9	31 7 59.7	- 1 10.5	+0.7912	0.5450	+0.0544	+90	+23	
1 Geminorum	5	0.26	0.2	23 16.1	9 6.6	- 0 5.8	-0.1147	0.5450	0.0521	+33	-26	
2 Geminorum	7	0.26	0.2	23 38.8	10 21.5	+ 1 6.6	-0.4714	0.5454	0.0493	+13	-46	
3 Geminorum	6 $\frac{1}{2}$	0.28	0.2	23 7.8	11 44.1	+ 2 26.4	+0.1683	0.5451	0.0466	+50	-10	
6 Geminorum	6 $\frac{1}{2}$	0.28	0.4	22 55.9	12 56.9	+ 3 36.9	+0.4437	0.5453	0.0439	+69	+ 5	
η Geminorum	3 $\frac{1}{2}$	+0.29	-0.5	+22 32.3	14 9.3	+ 4 46.9	+0.9317	0.5455	+0.0420	+90	+33	
9 Geminorum	6 $\frac{1}{2}$	0.30	0.2	23 46.7	15 6.4	+ 5 42.1	-0.4049	0.5458	0.0403	+17	-41	
μ Geminorum	3	+0.33	-0.5	+22 34.2	17 55.2	+ 8 25.3	+1.0410	0.5466	+0.0341	+90	+41	

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ω Geminorum	5 $\frac{1}{2}$	+0.46	-0.6	+24 22.2	1 12 14.6	+ 2 8.4	-0.6816	0.5474	-0.0037	0	-60
44 Geminorum	6	0.47	0.9	22 48.1	13 37.5	+ 3 28.6	+1.0555	0.5474	0.0066	+90	+45
48 Geminorum	6	0.49	0.5	24 18.8	16 54.6	+ 6 39.0	-0.6575	0.5473	0.0133	+ 2	-59
58 Geminorum	6 $\frac{1}{2}$	0.52	1.1	23 9.3	22 4.4	+11 38.5	+0.5315	0.5473	0.0237	+77	+11
82 Geminorum	6 $\frac{1}{2}$	+0.59	-1.3	+23 24.7	2 9 47.0	- 1 2.0	-0.1760	0.5464	-0.0481	+30	-28
84 Geminorum	6 $\frac{1}{2}$	0.59	1.6	22 36.9	11 53.2	+ 1 0.0	+0.6019	0.5463	0.0524	+84	+12
7 Cancri	6 $\frac{1}{2}$	0.61	1.7	22 22.7	16 58.5	+ 5 55.3	+0.5723	0.5455	0.0626	+81	+10
μ^1 Cancri	6 $\frac{1}{2}$	0.61	1.5	22 57.0	18 7.4	+ 7 1.9	-0.1371	0.5455	0.0648	+32	-28
μ^2 Cancri	5 $\frac{1}{2}$	0.61	1.7	21 54.1	18 49.7	+ 7 42.9	+0.9815	0.5454	0.0663	+90	+35
η Cancri	5 $\frac{1}{2}$	+0.63	-2.0	+20 48.9	3 6 39.0	- 4 50.9	+1.2665	0.5425	-0.0891	+90	+61
γ Cancri	4 $\frac{1}{2}$	0.64	2.5	21 51.9	11 40.5	+ 0 0.8	-0.3697	0.5414	0.0984	+19	-45
B. A. C. 3206	6 $\frac{1}{2}$	0.58	2.5	20 15.8	4 7 43.2	- 4 34.9	-0.9208	0.5352	0.1329	-14	-70
η Leonis	3 $\frac{1}{2}$	0.62	3.6	17 17.9	5 4 47.9	- 8 9.4	-0.7982	0.5284	0.1648	- 5	-73
42 Leonis	6	0.59	3.6	15 31.8	12 6.5	- 1 4.2	-0.0916	0.5268	0.1742	+35	-38
ι Leonis	5 $\frac{1}{2}$	+0.56	-3.6	+14 42.0	17 21.3	+ 4 1.0	-0.1099	0.5258	-0.1806	+34	-39
ω Virginis	6	0.41	3.6	8 44.6	7 3 30.4	-10 50.8	-0.3623	0.5170	0.2125	+20	-59
ξ Virginis	5 $\frac{1}{2}$	0.38	3.8	8 52.2	7 3.5	- 7 23.9	-1.2610	0.5170	0.2154	-39	-81
ν Virginis	4	0.38	4.4	7 8.8	7 22.0	- 7 5.9	+0.5453	0.5169	0.2154	+75	-10
π Virginis	4 $\frac{1}{2}$	0.33	3.3	7 13.6	15 12.2	+ 0 30.6	-1.2440	0.5160	0.2197	-37	-83
ϵ Virginis	5 $\frac{1}{2}$	+0.27	-2.9	+ 3 55.5	8 1 23.9	+10 24.3	+0.0631	0.5160	-0.2247	+43	-36
B. A. C. 4254	6	+0.19	2.7	+ 2 27.7	10 47.1	- 4 28.9	-0.4785	0.5160	0.2269	+14	-69
80 Virginis	6	-0.08	1.1	- 4 50.1	9 16 9.6	+ 0 1.4	+0.6241	0.5230	0.2272	+80	- 7
88 Virginis	6 $\frac{1}{2}$	0.14	-0.5	6 17.3	22 35.5	+ 6 15.6	+0.7120	0.5255	0.2251	+81	- 2
ξ^1 Libræ	6	0.46	+0.2	11 27.0	11 6 40.1	-10 40.4	-0.7947	0.5423	0.2040	- 8	-90
σ^1 Libræ	6 $\frac{1}{2}$	-0.62	+1.4	-15 9.0	18 54.7	+ 1 9.7	+0.6302	0.5505	-0.1906	+72	- 5
σ^2 Libræ	6 $\frac{1}{2}$	0.68	1.0	14 44.5	19 49.9	+ 2 3.1	+0.0345	0.5518	0.1897	+35	-38
ζ^1 Libræ	6	0.68	1.5	16 19.9	22 10.0	+ 4 18.3	+1.2380	0.5529	0.1865	+74	+40
ζ^2 Libræ	6	0.70	2.0	16 13.8	23 15.2	+ 5 21.3	+0.9309	0.5545	0.1854	+74	+13
ζ^3 Libræ	5 $\frac{1}{2}$	0.67	1.4	16 28.7	19 0 15.6	+ 6 19.7	+1.0035	0.5552	0.1842	+74	+18
η Libræ	6	-0.73	+0.8	-15 19.2	5 14.5	+11 8.2	-1.0925	0.5589	-0.1770	-31	-90
θ Libræ	4 $\frac{1}{2}$	0.79	1.1	16 24.4	9 29.8	- 8 45.5	-0.7117	0.5626	0.1706	- 7	-90
ν^2 Scorpii	4 $\frac{1}{2}$	0.91	1.7	19 10.5	17 17.5	- 1 14.5	+0.8480	0.5681	0.1575	+71	+ 8
ψ Ophiuchi	4 $\frac{1}{2}$	0.99	1.6	19 46.8	22 24.3	+ 3 41.0	+0.6813	0.5733	0.1488	+69	- 2
χ Ophiuchi	4 $\frac{1}{2}$	1.00	1.0	18 12.4	23 39.6	+ 4 53.7	-1.1070	0.5740	0.1462	-36	-90
ξ Ophiuchi	5	-1.29	+1.4	-20 59.6	13 21 32.8	+ 1 56.7	-0.9714	0.5909	-0.0992	-32	-90
58 Ophiuchi	5 $\frac{1}{2}$	1.38	0.1	21 37.8	14 6 19.9	+10 22.8	-1.1040	0.5978	0.0776	-44	-90
4 Sagittarii	5 $\frac{1}{2}$	1.49	0.2	23 48.3	12 35.4	- 7 37.0	+0.6443	0.6015	0.0610	+60	- 3
7 Sagittarii	6	1.50	+0.2	24 16.8	13 44.9	- 6 30.3	+1.0520	0.6023	0.0581	+66	+26
P. xvii, 330	5 $\frac{1}{2}$	1.50	-0.2	23 8.4	14 4.1	- 6 11.8	-0.1085	0.6026	0.0568	+14	-46
9 Sagittarii	6	-1.51	+0.2	-24 21.8	14 8.3	- 6 7.8	+1.1130	0.6027	-0.0564	+66	+32
P. xvii, 334	5 $\frac{1}{2}$	1.50	-0.3	22 50.5	14 11.4	- 6 4.9	-0.4140	0.6027	0.0564	-25	-67
B. A. C. 6161	5 $\frac{1}{2}$	1.54	0.4	23 43.5	17 8.5	- 3 15.0	+0.3150	0.6040	0.0488	+37	-22
24 Sagittarii	6	1.62	1.0	24 6.8	15 1 30.5	+ 4 46.1	+0.3903	0.6075	0.0252	+39	-17
25 Sagittarii	6 $\frac{1}{2}$	1.62	1.0	24 18.3	1 45.1	+ 5 0.2	+0.5746	0.6075	0.0249	+53	- 7
B. A. C. 6343	6 $\frac{1}{2}$	-1.63	-1.7	-23 35.9	3 15.2	+ 6 26.5	-0.1642	0.6074	-0.0207	+ 8	-50
26 Sagittarii	6 $\frac{1}{2}$	-1.64	-1.3	-23 56.1	4 29.8	+ 7 37.9	+0.1476	0.6082	-0.0166	+24	-31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	α'	y'	N.	S.
		$\Delta\alpha$ $\Delta\delta$		d h m	h m					
ν^1 Sagittarii	5	-1.67 - 2.2	-22 52.7	15 9 7.1	-11 56.3	-0.9486	0.6098	-0.0033	-36	-90
ν^2 Sagittarii	5	1.69 2.2	22 48.5	9 28.1	-11 36.2	-1.0200	0.6102	0.0028	-43	-90
B. A. C. 6448	6 $\frac{1}{2}$	1.70 2.2	23 18.8	9 47.8	-11 17.4	-0.5199	0.6102	-0.0018	-13	-76
χ^1 Sagittarii	5 $\frac{1}{2}$	1.83 3.0	24 43.3	20 38.7	-0 53.9	+1.0280	0.6118	+0.0297	+65	+24
χ^2 Sagittarii	6 $\frac{1}{2}$	1.83 3.1	24 37.6	20 41.1	-0 51.6	+0.9354	0.6118	0.0298	+65	+17
χ^3 Sagittarii	5 $\frac{1}{2}$	-1.83 - 3.1	-24 10.7	20 44.3	-0 48.5	+0.4933	0.6118	+0.0300	+16	-12
53 Sagittarii	6 $\frac{1}{2}$	1.84 3.9	23 40.6	16 2 3.7	+4 17.4	+0.1993	0.6121	0.0453	+20	-28
B. A. C. 6727	6	1.84 3.9	23 40.9	2 10.3	+4 23.7	+0.2076	0.6121	0.0458	+30	-28
4 Capricorni	6	1.92 5.6	22 9.0	16 18.6	-6 3.8	-0.3706	0.6115	0.0860	+3	-63
NEW MOON.										
ψ^1 Aquarii	4	-1.77 -11.7	-9 41.4	19 15 19.9	-9 49.3	-0.9369	0.5681	+0.2238	-15	-90
ψ^2 Aquarii	4	1.77 11.7	9 47.2	16 13.2	-8 58.0	-0.6423	0.5674	0.2245	+3	-84
ψ^3 Aquarii	4 $\frac{1}{2}$	1.76 12.1	10 12.9	16 40.6	-8 31.5	-0.1115	0.5667	0.2248	+31	-46
B. A. C. 8274	7	1.70 11.6	6 59.7	20 5 42.9	+4 3.3	-0.3383	0.5585	0.2345	+20	-59
30 Piscium	4 $\frac{1}{2}$	-1.66 -11.9	-6 37.8	11 45.0	+9 53.0	+0.7209	0.5552	+0.2375	+83	-1
33 Piscium	5	1.66 11.8	6 19.6	13 17.0	+11 21.8	+0.7780	0.5541	0.2379	+74	+2
B. A. C. 17	6	1.63 11.2	5 51.7	15 32.7	-10 27.1	+0.8500	0.5527	0.2389	+84	+7
14 Ceti	6	1.57 10.9	1 6.8	21 3 9.0	+0 45.9	-1.1765	0.5464	0.2409	-29	-90
15 Ceti	6 $\frac{1}{2}$	1.56 10.9	-1 6.8	4 20.1	+1 54.6	-0.8948	0.5464	0.2411	-10	-90
26 Ceti	6	-1.52 -10.4	+0 46.4	16 25.1	-10 24.2	+0.0838	0.5408	+0.2395	+44	-35
29 Ceti	6 $\frac{1}{2}$	1.45 10.2	1 24.9	18 23.8	-8 29.2	-0.1027	0.5405	0.2390	+34	-45
33 Ceti	6	1.44 9.9	1 51.5	19 37.2	-7 18.2	-0.2654	0.5396	0.2385	+26	-55
35 Ceti	6 $\frac{1}{2}$	1.44 10.1	1 53.2	20 33.5	-6 23.8	-0.0702	0.5388	0.2380	+36	-44
f Piscium	5	1.43 9.6	3 1.9	23 4.0	-3 58.1	-0.6536	0.5380	0.2370	+5	-84
ν Piscium	4 $\frac{1}{2}$	-1.32 - 9.3	+4 55.6	23 10 23.6	+6 59.8	+0.0450	0.5360	+0.2318	+42	-36
64 Ceti	5 $\frac{1}{2}$	1.24 7.9	8 3.2	23 0 51.5	-2 59.7	+0.0680	0.5328	0.2215	+44	-34
ξ^1 Ceti	4 $\frac{1}{2}$	1.22 7.7	8 19.7	1 38.9	-2 13.9	-0.0436	0.5322	0.2206	+38	-40
ξ Arietis	5 $\frac{1}{2}$	1.18 6.9	10 6.6	7 22.3	+3 18.8	-0.6666	0.5322	0.2158	+4	-79
B. A. C. 755	6 $\frac{1}{2}$	1.17 6.8	10 4.0	8 19.2	+4 13.8	-0.4175	0.5322	0.2150	+17	-61
B. A. C. 830	6	-1.20 - 6.6	+10 16.2	15 58.5	+11 38.7	+0.9842	0.5320	+0.2071	+90	+18
38 Arietis	5	1.09 6.0	11 58.9	17 8.9	-11 13.1	-0.5838	0.5319	0.2057	+8	-72
Lalande 5725	6	1.01 5.4	12 45.9	24 3 34.4	-1 7.3	+0.6697	0.5323	0.1938	+82	+2
B. A. C. 1119	6	0.85 3.6	16 10.7	18 31.8	-10 40.1	-0.0573	0.5337	0.1724	+37	-35
B. A. C. 1206	6	0.79 3.2	16 59.9	25 2 8.0	-3 16.5	+0.1654	0.5341	0.1626	+49	-22
B. A. C. 1240	6	-0.65 - 2.2	+17 53.0	5 47.8	+0 16.3	-0.2036	0.5348	+0.1569	+28	-41
B. A. C. 1272	6	0.70 2.8	17 2.7	8 15.9	+2 37.6	+1.0890	0.5356	0.1535	+90	+33
NEPTUNE			18 56.3	8 34.9	+2 58.0	-0.9151	0.5352	0.1526	-13	-71
ω^1 Tauri	6	0.71 1.9	19 19.0	9 46.7	+4 7.5	-1.1430	0.5356	0.1509	-31	-71
ϵ Tauri	3 $\frac{1}{2}$	0.59 1.8	18 56.2	19 5.0	-10 52.0	+0.6008	0.5375	0.1356	+92	+4
W. iv, 650	6	-0.55 - 1.2	+20 27.8	23 38.9	-6 27.0	-0.4601	0.5382	+0.1276	+14	-54
ι Tauri	5	0.42 0.7	21 25.9	26 11 23.0	+4 54.3	-0.1442	0.5399	0.1062	+31	-33
105 Tauri	6	0.39 0.5	21 33.6	13 39.7	+7 6.6	-0.0475	0.5408	0.1024	+37	-27
108 Tauri	6 $\frac{1}{2}$	0.35 0.0	22 9.6	17 11.9	+10 31.9	-0.3547	0.5410	0.0956	+20	-44
π Tauri	5 $\frac{1}{2}$	0.33 0.1	21 59.0	18 59.7	-11 43.9	+0.0073	0.5420	0.0924	+40	-23
σ Tauri	6	-0.27 - 0.1	+21 50.5	22 55.3	-7 56.0	+0.5111	0.5421	+0.0845	+74	+5
B. A. C. 1801	6	0.21 + 0.3	23 9.2	27 6 14.1	-0 51.6	-0.3677	0.5441	0.0708	+19	-42
141 Tauri	6 $\frac{1}{2}$	0.10 0.2	22 23.9	14 49.2	+7 26.5	+0.9084	0.5449	0.0531	+90	+37
1 Geminorum	5	0.09 0.4	23 16.1	15 55.9	+8 31.0	+0.0939	0.5450	0.0509	+45	-14
2 Geminorum	7	0.09 0.5	23 38.8	17 10.6	+9 43.2	-0.2615	0.5451	0.0484	+25	-33
3 Geminorum	6 $\frac{1}{2}$	-0.06 + 0.4	+23 7.8	18 32.8	+11 2.7	+0.3721	0.5449	+0.0456	+64	+1
5 Geminorum	6 $\frac{1}{2}$	0.04 0.8	24 26.6	19 21.4	+11 49.7	-1.0420	0.5449	0.0442	-25	-66
6 Geminorum	6 $\frac{1}{2}$	0.05 0.4	22 55.9	19 45.3	-11 47.1	+0.6465	0.5449	0.0433	+90	+16
7 Geminorum	3 $\frac{1}{2}$	0.04 0.2	22 32.3	20 57.6	-10 37.2	+1.1310	0.5449	0.0406	+90	+49
9 Geminorum	6 $\frac{1}{2}$	-0.02 0.6	23 46.7	21 54.3	-9 42.5	-0.2026	0.5449	0.0386	+28	-29
μ Geminorum	3	0.00 + 0.3	+22 34.2	28 0 42.6	-6 59.7	+1.2345	0.5455	+0.0328	+90	+60
ω Geminorum	5 $\frac{1}{2}$	+0.21 + 0.7	+24 22.2	18 59.9	+10 41.2	-0.5024	0.5459	-0.0052	+11	-45

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
44 Geminorum	6	+0.22	+ 0.3	+22° 48.1	28 20 22.7	-11 58.8	+1.2260	0.5459	-0.0083	+90°	+61°
48 Geminorum	6	+0.26	+ 0.6	+24 18.8	23 39.8	- 8 48.3	-0.4881	0.5455	-0.0151	+12	-45

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58 Geminorum	6½	+0.31	+0.2	+23 9.3	1 4 49.5	- 3 48.8	+0.6913	0.5451	-0.0255	+90	+20
82 Geminorum	6½	0.43	+0.1	23 24.7	16 32.6	+ 7 31.1	-0.0333	0.5445	0.0500	+38	-21
84 Geminorum	6½	0.45	-0.2	22 36.9	18 38.8	+ 9 53.2	+0.7432	0.5444	0.0540	+90	+20
7 Cancri	6½	0.49	0.5	22 22.7	23 44.4	- 9 31.2	+0.7025	0.5439	0.0641	+90	+17
μ^1 Cancri	6½	0.50	0.2	22 57.0	2 0 53.3	- 8 24.6	-0.0055	0.5437	0.0663	+39	-22
μ^2 Cancri	5½	+0.48	-0.5	+21 54.1	1 35.6	- 7 43.7	+1.1109	0.5435	-0.0677	+90	+44
γ Cancri	4½	0.60	1.0	21 51.9	18 27.0	+ 8 34.9	-0.2675	0.5403	0.1004	+25	-39
B. A. C. 3206	6½	0.59	1.9	20 15.8	3 14 29.2	+ 3 58.7	-0.8604	0.5348	0.1355	- 9	-70
η Leonis	3½	0.81	3.3	17 17.9	4 11 30.1	+ 0 20.3	0.5299	0.5299	0.1674	- 4	-73
42 Leonis	6	0.82	3.8	15 31.8	18 46.7	+ 7 23.5	-0.0931	0.5274	0.1767	+35	-38
ι Leonis	5½	+0.82	-4.0	+14 41.9	23 59.6	-11 33.1	-0.1204	0.5268	-0.1837	+33	-40
ω Virginis	6	0.80	5.0	8 44.5	6 9 52.2	- 2 41.5	-0.4512	0.5201	0.2163	+16	-65
ν Virginis	4	0.79	5.2	7 8.7	13 41.5	+ 1 1.1	+0.4449	0.5198	0.2187	+67	-15
ϵ Virginis	5½	0.80	5.3	3 55.5	7 7 31.8	- 5 40.3	-0.0770	0.5195	0.2281	+36	-44
B. A. C. 4254	6	0.71	5.4	+ 2 27.7	16 48.8	+ 3 20.2	-0.6357	0.5199	0.2306	+ 6	-82
80 Virginis	6	+0.56	-4.6	- 4 50.1	8 21 53.6	+ 7 32.8	+0.4081	0.5258	-0.2298	+64	-18
88 Virginis	6½	0.54	4.4	6 17.3	9 4 16.6	-10 15.9	+0.4850	0.5278	0.2278	+69	-14
B. A. C. 4647	6½	0.52	4.2	7 31.0	7 35.3	- 7 3.3	+1.0300	0.5293	0.2263	+82	+18
94 Virginis	6½	0.44	4.1	8 22.0	13 9.3	- 1 39.7	+0.6748	0.5310	0.2234	+81	- 4
95 Virginis	6	0.48	3.8	8 47.3	13 21.8	- 1 27.6	+1.0720	0.5313	0.2234	+81	+21
ζ^1 Libræ	6	+0.30	-3.3	-11 27.0	10 12 14.2	- 3 18.9	-1.0555	0.5413	-0.2054	-24	-90
α^1 Libræ	6½	0.23	2.2	15 9.0	11 0 30.9	+ 8 33.3	+0.3690	0.5507	0.1913	+54	-20
α^2 Libræ	6½	0.19	2.4	14 44.5	1 26.2	+ 9 26.8	-0.2926	0.5513	0.1901	+22	-53
β^1 Libræ	6	0.18	1.6	16 19.9	3 47.2	+11 43.0	+0.9757	0.5522	0.1870	+74	+16
ζ^3 Libræ	6	0.17	1.5	16 13.8	4 52.7	-11 13.8	+0.6661	0.5524	0.1854	+72	- 4
ζ^4 Libræ	5½	+0.14	-1.9	-16 28.7	5 53.5	-10 15.0	+0.7370	0.5531	-0.1839	+73	+ 1
θ Libræ	4½	+0.04	2.0	16 24.4	15 12.3	- 1 15.6	-0.9861	0.5589	0.1702	-24	-90
ν^2 Scorpii	4½	-0.02	1.1	19 10.5	23 5.4	+ 6 20.8	+0.5851	0.5648	0.1571	+64	- 8
MARS				20 1.8	12 1 30.6	+ 8 40.8	+1.0960	0.5530	0.1496	+70	+27
ψ Ophiuchi	4½	0.10	1.1	19 46.8	4 16.8	+11 21.0	+0.4168	0.5675	0.1475	+52	-17
4 Sagittarii	5½	-0.62	-0.5	-23 48.3	13 19 17.4	+ 0 52.6	+0.4068	0.5928	-0.0598	+43	-17
7 Sagittarii	6	0.64	0.5	24 16.8	20 29.0	+ 2 1.4	+0.8208	0.5928	0.0563	+66	+ 8
P. xvii, 330	5½	0.64	0.9	23 8.4	20 48.6	+ 2 20.2	-0.3554	0.5928	0.0555	+ 2	-62
9 Sagittarii	6	0.64	0.5	24 21.8	20 53.0	+ 2 24.4	+0.8816	0.5928	0.0554	+66	+12
P. xvii, 334	5½	0.64	1.0	22 50.5	20 56.1	+ 2 27.3	-0.6666	0.5928	0.0551	-16	-90
B. A. C. 6161	5½	-0.69	-0.8	-23 43.5	23 58.3	+ 5 22.4	+0.0762	0.5944	-0.0470	+23	-35
24 Sagittarii	6	0.78	1.0	24 6.8	14 8 35.4	-10 21.3	+0.1619	0.5970	0.0236	+25	-30
25 Sagittarii	6½	0.79	0.9	24 18.3	8 50.5	-10 6.8	+0.3490	0.5971	0.0233	+36	-20
B. A. C. 6343	6½	0.80	1.3	23 35.9	10 23.3	- 8 37.7	-0.3980	0.5976	0.0186	- 5	-66
26 Sagittarii	6½	0.82	1.2	23 56.1	11 40.2	- 7 23.9	-0.0791	0.5976	0.0151	+12	-45
B. A. C. 6369	6	-0.85	-0.8	-25 7.2	12 47.9	- 6 19.0	+1.1030	0.5978	-0.0125	+65	+31
ν^1 Sagittarii	5	0.87	1.7	22 52.7	16 26.5	- 2 49.2	-1.1900	0.5994	0.0020	-58	-90
B. A. C. 6448	6½	0.90	1.7	23 18.8	17 8.5	- 2 9.0	-0.7508	0.5997	-0.0003	-26	-90
χ^1 Sagittarii	5½	1.04	1.8	24 43.3	15 4 21.1	+ 8 36.2	+0.8389	0.6008	+0.0302	+65	+ 9
χ^2 Sagittarii	6½	1.04	1.9	24 37.6	4 23.6	+ 8 38.6	+0.7433	0.6008	0.0314	+65	+ 3
χ^3 Sagittarii	5½	-1.03	-2.0	-24 10.7	4 26.9	+ 8 41.8	+0.2937	0.6008	+0.0314	+34	-23
λ^1 Sagittarii	6	1.09	2.0	24 57.6	8 28.4	-11 26.5	+1.2260	0.6008	0.0424	+65	+46
53 Sagittarii	6½	1.11	1.7	23 40.7	9 57.2	-10 1.4	+0.0050	0.6011	0.0462	+19	-40
B. A. C. 6727	6	1.11	1.7	23 40.9	10 4.0	- 9 54.8	+0.0134	0.6011	0.0462	+20	-40
4 Capricorni	6	1.23	3.7	22 9.0	16 0 41.3	+ 4 6.8	-0.6343	0.5983	0.0834	-12	-88
17 Capricorni	6	-1.35	-4.7	-21 54.9	11 38.7	- 9 22.2	+0.3150	0.5951	+0.1142	+42	-22
η Capricorni	5	-1.41	-5.6	-20 17.5	18 51.0	- 2 27.1	-0.4217	0.5926	+0.1317	+ 5	-67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
χ Capricorni	5 $\frac{1}{2}$	-1.43	-5.5	-21 38.2	16 20 28.4	- 0 53.6	+1.1400	0.5902	+0.1357	+68	+32
27 Capricorni	6 $\frac{1}{2}$	1.42	5.6	20 59.9	20 52.2	- 0 30.7	+0.5550	0.5916	0.1367	+60	- 9
ϕ Capricorni	5 $\frac{1}{2}$	1.45	5.7	21 6.6	23 17.5	+ 1 48.9	+1.0030	0.5910	0.1417	+69	+20
ϵ Capricorni	4 $\frac{1}{2}$	1.48	6.5	19 57.6	17 7 55.0	+10 6.3	+1.1580	0.5860	0.1604	+70	+33
κ Capricorni	5	1.49	6.7	19 22.2	10 10.6	-11 43.3	+0.9385	0.5848	0.1647	+71	+14
29 Aquarii <i>mult.</i>	6 $\frac{1}{2}$	-1.53	-7.6	-17 29.8	18 17.6	- 3 54.9	+0.4717	0.5813	+0.1808	+59	-14
50 Aquarii	6	1.43	8.6	14 5.4	18 3 29.3	+ 4 56.1	-1.2000	0.5757	0.1963	-39	-90
γ Aquarii	4	1.59	9.1	-14 10.6	14 9.9	- 8 46.7	+1.0650	0.5695	0.2117	+76	+55
NEW MOON.											
f Piscium	5	-1.56	-9.6	+ 3 1.9	21 9 24.6	+ 8 10.7	-0.2803	0.5415	+0.2405	+25	-56
ν Piscium	4 $\frac{1}{2}$	1.53	9.4	4 55.7	20 36.4	- 4 59.3	+0.2238	0.5408	0.2359	+53	-27
64 Ceti	5 $\frac{1}{2}$	1.49	8.4	8 3.2	22 10 50.8	+ 8 47.7	+0.2796	0.5390	0.2260	+56	-23
ξ Ceti	4 $\frac{1}{2}$	1.48	8.3	8 19.7	11 37.4	+ 9 32.7	+0.1684	0.5387	0.2252	+50	-29
ξ Arietis	5 $\frac{1}{2}$	1.46	7.6	10 6.6	17 14.7	- 9 0.7	-0.4372	0.5385	0.2202	+17	-63
B. A. C. 755	6 $\frac{1}{2}$	-1.46	-7.3	+10 4.0	18 10.4	- 8 6.9	-0.1899	0.5382	+0.2192	+30	-47
31 Arietis	5 $\frac{1}{2}$	1.44	7.0	11 58.2	22 50.6	- 3 35.7	-1.1710	0.5382	0.2145	-30	-78
B. A. C. 830	6	1.43	7.3	10 16.2	23 1 40.6	- 0 51.2	+1.2145	0.5378	0.2110	+90	+37
38 Arietis	5	1.43	6.9	11 58.9	2 49.5	+ 0 15.5	-0.3398	0.5383	0.2100	+22	-56
Lalande 5725	6	1.36	6.2	12 45.9	13 1.9	+10 8.2	+0.9156	0.5387	0.1976	+90	+16
B. A. C. 1119	6	-1.27	-4.5	+16 10.6	24 4 38.2	+ 1 14.3	+0.2186	0.5403	+0.1759	+53	-21
B. A. C. 1206	6	1.21	4.0	16 59.8	11 5.9	+ 7 29.3	+0.4474	0.5407	0.1658	+68	- 8
B. A. C. 1240	6	1.19	3.4	17 52.9	14 40.5	+10 56.9	+0.0822	0.5410	0.1599	+45	-25
NEPTUNE				19 3.1	18 15.3	- 9 35.3	-0.6110	0.5413	0.1540	+ 6	-66
ω Tauri	6	1.16	2.8	19 19.0	18 34.4	- 9 16.9	-0.8476	0.5423	0.1536	- 8	-71
ϵ Tauri	3 $\frac{1}{2}$	-1.07	-2.6	+18 56.2	25 3 40.8	- 0 28.4	+0.8884	0.5429	+0.1376	+90	+21
W. iv, 650	6	1.04	1.9	20 27.8	8 9.2	+ 3 51.2	-0.1622	0.5433	0.1297	+31	-36
ζ Tauri	5	0.91	1.1	21 25.9	19 39.9	- 9 0.9	+0.1540	0.5451	0.1078	+49	-17
105 Tauri	6	0.89	0.9	21 33.6	21 53.7	- 6 51.6	+0.2504	0.5459	0.1035	+55	-11
108 Tauri	6 $\frac{1}{2}$	0.85	0.4	22 9.6	26 1 22.1	- 3 30.1	-0.0563	0.5459	0.0962	+37	-26
π Tauri	5 $\frac{1}{2}$	-0.83	-0.4	+21 59.0	3 8.1	- 1 47.7	+0.3055	0.5459	+0.0933	+59	- 7
σ Tauri	6	0.78	0.4	21 50.5	6 59.7	+ 1 56.2	+0.8037	0.5459	0.0854	+90	+21
B. A. C. 1801	6	0.70	-0.3	23 9.2	14 11.8	+ 8 53.9	-0.0675	0.5469	0.0711	+36	-25
1 Geminorum	5	0.58	+0.4	23 16.1	23 45.6	- 5 51.5	+0.3901	0.5474	0.0509	+65	+ 2
2 Geminorum	7	0.60	0.8	23 38.8	27 0 59.3	- 4 40.3	+0.0348	0.5474	0.0482	+42	-17
3 Geminorum	6 $\frac{1}{2}$	-0.57	+0.7	+23 7.8	2 20.6	- 3 21.8	+0.6668	0.5474	+0.0458	+90	+17
5 Geminorum	6 $\frac{1}{2}$	0.55	1.2	24 26.7	3 8.6	- 2 35.4	-0.7437	0.5474	0.0458	- 3	-66
6 Geminorum	6 $\frac{1}{2}$	0.55	1.1	22 55.0	3 32.3	- 2 12.5	+0.9361	0.5474	0.0430	+90	+33
9 Geminorum	6 $\frac{1}{2}$	0.53	0.9	23 46.7	5 39.7	- 0 9.4	+0.0936	0.5478	0.0385	+46	-13
ϵ Geminorum	3 $\frac{1}{2}$	0.37	1.7	25 14.4	18 1.7	+11 47.8	-1.2060	0.5468	+0.0121	-44	-65
ω Geminorum	5 $\frac{1}{2}$	-0.26	+2.3	+24 22.2	28 2 34.3	- 3 56.7	-0.2192	0.5464	-0.0061	+27	-27
48 Geminorum	6	0.20	1.8	24 18.8	7 12.7	+ 0 32.3	-0.2026	0.5457	0.0156	+28	-27
52 Geminorum	6 $\frac{1}{2}$	0.18	2.1	25 4.5	8 14.2	+ 1 31.8	-1.0670	0.5457	0.0177	-27	-65
54 Geminorum	6 $\frac{1}{2}$	0.13	1.4	23 9.3	12 21.0	+ 5 30.4	+0.9670	0.5457	0.0262	+90	+37
κ Geminor. <i>mult.</i>	3 $\frac{1}{2}$	-0.01	2.0	24 39.7	22 5.1	- 9 4.8	-1.0590	0.5438	0.0466	-26	-65
82 Geminorum	6 $\frac{1}{2}$	+0.01	+1.6	+23 24.7	29 0 2.0	- 7 11.8	+0.2307	0.5435	-0.0506	+54	- 8
84 Geminorum	6 $\frac{1}{2}$	0.03	1.3	22 36.9	2 8.2	- 5 9.8	+1.0020	0.5428	0.0547	+90	+37
7 Cancri	6 $\frac{1}{2}$	0.10	1.2	22 22.7	7 13.5	- 0 14.4	+0.9576	0.5421	0.0648	+90	+33
μ Cancri	6 $\frac{1}{2}$	0.11	1.3	22 57.0	8 22.2	+ 0 52.0	+0.2491	0.5420	0.0670	+55	- 8
γ Cancri	4 $\frac{1}{2}$	0.30	+0.8	21 51.9	30 1 56.9	- 6 7.5	-0.0332	0.5373	0.1012	+38	-26
B. A. C. 3206	6 $\frac{1}{2}$	+0.51	-0.2	+20 15.8	22 2.0	-10 40.8	-0.6600	0.5327	-0.1365	+ 3	-68
η Leonis	3 $\frac{1}{2}$	+0.68	-1.7	+17 17.9	31 19 6.3	+ 9 44.2	-0.6162	0.5272	-0.1687	+ 6	-69

APRIL.

42 Leonis	6	+0.71	-2.2	+15 31.8	1 2 23.7	- 7 11.8	+0.0565	0.5250	-0.1785	+43	-30
ι Leonis	5 $\frac{1}{2}$	+0.73	-2.5	+14 41.9	7 37.1	- 2 7.9	+0.0163	0.5250	-0.1853	+41	-33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
ω Virginis	6	+0.88	-4.8	+ 8 44.5	2 17 26.7	+ 6 40.8	-0.3939	0.5206	-0.2191	+20	-61
ν Virginis	4	0.90	5.1	7 8.7	21 15.0	+10 22.3	+0.4883	0.5204	0.2215	+70	-13
ϵ Virginis	5.4	0.95	6.0	3 55.4	3 14 57.9	+ 3 33.5	-0.0766	0.5214	0.2317	+36	-44
B. A. C. 4254	6	0.95	5.9	+ 2 27.6	4 0 9.4	-11 31.5	-0.6572	0.5228	0.2346	+ 5	-84
65 Virginis	6	0.96	6.2	- 4 21.0	22 47.8	+10 25.8	+1.2200	0.5277	0.2355	+36	+33
66 Virginis	6	+0.96	-6.2	4 35.4	23 23.9	+11 0.8	+1.3320	0.5280	-0.2355	+85	+47
80 Virginis	6	0.95	6.2	4 50.2	5 4 51.0	- 7 42.2	+0.3070	0.5303	0.2344	+57	-24
88 Virginis	6.4	0.95	6.2	6 17.4	11 7.8	- 1 37.2	+0.3671	0.5320	0.2322	+61	-21
B. A. C. 4647	6.4	0.95	6.0	7 31.1	14 23.0	+ 1 32.0	+0.9036	0.5343	0.2310	+82	+ 9
94 Virginis	6.4	0.93	5.9	8 22.1	19 51.5	+ 6 50.1	+0.5357	0.5358	0.2282	+71	-12
95 Virginis	6	+0.93	-5.8	- 8 47.4	20 3.5	+ 7 1.7	+0.9303	0.5358	-0.2277	+81	+11
κ Virginis	4.4	0.92	5.8	9 45.8	23 1.0	+ 9 53.6	+1.2750	0.5378	0.2261	+90	+40
σ^1 Libræ	6.4	0.83	4.5	15 9.1	7 6 35.1	- 7 35.0	+0.1631	0.5660	0.1950	+42	-31
σ^2 Libræ	6.4	0.82	4.7	14 44.6	7 29.5	- 6 42.5	-0.4337	0.5558	0.1933	+11	-67
ζ^3 Libræ	6	0.80	3.8	16 13.8	10 52.5	- 3 26.5	+0.4543	0.5580	0.1890	+59	-16
ζ^4 Libræ	5.4	+0.79	-4.2	-16 28.7	11 52.3	- 2 28.8	+0.5214	0.5590	-0.1876	+63	-12
θ Libræ	4.4	0.73	4.0	16 24.4	21 1.9	+ 6 21.4	-1.2040	0.5640	0.1732	-42	-90
β^1 Scorpii	2	0.73	3.2	19 30.2	1 59.5	+11 8.5	+1.1420	0.5671	0.1644	+70	+30
β^2 Scorpii	5.4	0.73	3.2	19 30.0	1 59.6	+11 8.6	+1.1390	0.5671	0.1644	+70	+30
ν^2 Scorpii	4.4	0.70	3.2	19 10.5	4 48.1	-10 9.1	+0.3425	0.5693	0.1596	+48	-21
ψ Ophiuchi	4.4	+0.65	-2.9	-19 46.8	9 55.2	- 5 13.3	+0.1795	0.5722	-0.1499	+38	-30
ω Ophiuchi	4.4	0.63	2.5	21 13.8	13 15.8	- 2 0.0	+1.1760	0.5746	0.1435	+69	+35
MARS				21 46.7	20 22.7	+ 4 51.0	+0.7720	0.5745	0.1264	+68	+ 4
ϵ^2 Ophiuchi	5	0.40	1.2	23 52.6	9 13 24.4	- 2 46.5	+1.0590	0.5880	0.0881	+66	+26
4 Sagittarii	5.4	0.27	0.8	23 48.3	10 0 39.4	+ 8 1.9	+1.1475	0.5915	0.0596	+28	-31
7 Sagittarii	6	+0.27	-0.7	-24 16.8	1 51.0	+ 9 10.7	+0.5627	0.5921	-0.0568	+53	- 8
P. xvii, 330	5.4	0.26	1.0	23 8.4	2 10.8	+ 9 29.8	-0.6170	0.5921	0.0560	-13	+36
9 Sagittarii	6	0.27	0.6	24 21.8	2 15.0	+ 9 33.8	+0.6237	0.5921	0.0555	+58	- 5
P. xvii, 334	5.4	0.26	0.6	22 50.5	2 18.2	+ 9 36.8	-0.9253	0.5921	0.0555	-32	-90
B. A. C. 6161	5.4	0.22	0.8	23 43.5	5 20.7	-11 27.9	-0.1847	0.5932	0.0474	+ 9	-51
24 Sagittarii	6	+0.09	-0.8	-24 6.8	13 59.3	- 3 10.1	-0.0964	0.5951	-0.0237	+11	-46
25 Sagittarii	6.4	0.09	0.8	24 18.3	14 14.5	- 2 55.4	+0.0914	0.5951	0.0232	+22	-35
B. A. C. 6343	6.4	0.07	0.7	23 35.9	15 47.8	- 1 25.9	-0.6600	0.5993	0.0192	-19	-90
26 Sagittarii	6.4	0.05	0.5	23 56.1	17 5.3	- 0 11.6	-0.3401	0.5958	0.0156	- 3	-62
B. A. C. 6369	6	+0.03	1.1	25 7.2	18 13.2	+ 0 53.6	+0.8461	0.5961	-0.0127	+65	+10
B. A. C. 6448	6.4	-0.03	-0.8	-23 18.8	22 35.8	+ 5 5.6	-1.0150	0.5967	0.0000	-43	-90
ψ Sagittarii	5.4	0.11	0.3	25 26.7	11 6 7.8	-11 40.5	+1.2230	0.5961	+0.0203	+65	+46
χ^1 Sagittarii	5.4	0.16	0.3	24 43.3	9 55.4	- 8 2.1	+0.5878	0.5961	0.0309	+53	- 7
χ^2 Sagittarii	6.4	0.16	0.3	24 37.6	9 58.1	- 7 59.5	+0.4932	0.5960	0.0311	+46	-12
χ^3 Sagittarii	5.4	0.17	0.4	24 10.7	10 1.4	- 7 56.3	+0.0405	0.5960	0.0311	+20	-38
λ^1 Sagittarii	6	-0.22	-0.2	-24 57.6	14 6.1	- 4 1.4	+0.9631	0.5958	+0.0422	+65	+20
λ^2 Sagittarii	4.4	0.23	0.1	25 7.5	14 21.7	- 3 46.5	+1.1620	0.5958	0.0431	+65	+17
53 Sagittarii	6.4	0.25	0.6	23 40.6	15 36.2	- 2 35.0	-0.2499	0.5955	0.0465	+ 6	-56
B. A. C. 6727	6	0.25	0.7	23 40.8	15 43.1	- 2 28.4	-0.2415	0.5955	0.0465	+ 6	-55
4 Capricorni	6	0.43	1.2	22 8.9	12 6 35.8	+11 48.7	-0.7992	0.5916	0.0864	-22	-90
17 Capricorni	6	-0.59	-1.7	-21 54.8	17 47.7	- 1 25.8	+0.0843	0.5875	+0.1139	+29	-35
η Capricorni	5	0.65	2.3	20 17.4	13 1 10.4	+ 5 39.8	-0.6526	0.5840	0.1309	- 9	-89
γ Capricorni	5.4	0.68	2.0	21 38.2	2 50.0	+ 7 15.5	+0.9292	0.5830	0.1349	+68	+14
27 Capricorni	6.4	0.68	2.2	20 59.9	3 14.7	+ 7 39.3	+0.3406	0.5826	0.1354	+46	-21
ϕ Capricorni	5.4	0.71	2.2	21 6.6	5 43.8	+10 2.7	+0.7976	0.5818	0.1414	+69	+ 5
ϵ Capricorni	4.4	-0.82	-2.8	-19 57.6	14 35.2	- 5 25.9	+0.9663	0.5769	+0.1580	+70	+16
κ Capricorni	5	0.85	3.0	19 22.1	16 54.7	- 3 11.7	+0.7454	0.5758	0.1641	+69	+ 1
29 Aquarii	mult.	5	0.91	3.7	17 29.7	+ 4 50.8	+0.2833	0.5706	0.1791	+47	-24
56 Aquarii	6.4	1.03	5.0	15 8.9	13 15.0	- 7 35.9	+0.1757	0.5644	0.1985	+43	-30
τ^1 Aquarii	mult.	5.4	1.10	5.3	14 38.2	- 0 14.3	+1.2170	0.5609	0.2094	+75	+35
τ^2 Aquarii	4	-1.11	-5.4	-14 10.5	21 43.1	+ 0 34.2	+0.9239	0.5605	+0.2102	+76	+12
74 Aquarii	6	-1.12	-5.8	-12 12.2	23 26.9	+ 2 14.3	-0.7107	0.5594	+0.2123	- 3	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		$^{\circ}$ $'$ $''$					
ψ Aquarii	4	-1.18	-6.6	-9 41.3	15 9 27.8	+11 54.5	-1.0830	0.5545	+0.2238	-25 -90
ψ Aquarii	4	1.18	6.6	9 47.1	10 23.5	-11 11.8	-0.7780	0.5549	0.2246	-5 -90
ψ Aquarii	4 $\frac{1}{2}$	1.19	6.7	10 12.8	10 52.0	-10 44.2	-0.2356	0.5540	0.2250	+25 -54
B. A. C. 8274	7	1.27	7.3	6 59.6	16 0 24.0	+2 20.3	-0.3929	0.5474	0.2353	+18 -63
30 Piscium	4 $\frac{1}{2}$	1.31	7.4	6 37.7	6 37.2	+5 21.2	+0.7091	0.5457	0.2387	+83 -3
33 Piscium	5	-1.31	-7.5	-6 19.5	8 11.8	+9 52.6	+0.7767	0.5459	+0.2399	+75 +1
B. A. C. 17	6	1.33	7.6	5 51.6	10 31.3	-11 52.5	+0.8620	0.5449	0.2407	+84 +7
14 Ceti	6	1.40	8.2	-1 6.7	22 23.4	-0 23.7	-1.1210	0.5413	0.2440	-24 -90
NEW MOON.										
Lalande 5725	6	-1.49	-6.1	+12 45.9	19 22 21.8	-2 43.7	+1.0570	0.5407	+0.2000	+90 +25
B. A. C. 1119	6	1.48	4.9	16 10.6	20 13 52.0	-11 44.0	+0.3866	0.5434	0.1781	+64 -12
B. A. C. 1206	6	1.44	4.4	16 59.8	20 16.1	-5 32.5	+0.6263	0.5445	0.1687	+85 +2
B. A. C. 1240	6	1.44	3.9	17 52.9	23 48.8	-2 6.9	+0.2674	0.5450	0.1626	+56 -17
ω Tauri	6	1.44	3.5	19 18.9	21 3 39.9	+1 36.6	-0.6536	0.5460	0.1561	+4 -68
NEPTUNE										
ω Tauri	5 $\frac{1}{2}$	-1.42	-3.0	20 18.3	7 24.3	+5 13.6	-1.1440	0.5468	0.1494	-31 -70
ϵ Tauri	3 $\frac{1}{2}$	1.37	3.0	18 56.1	12 40.1	+10 18.9	+1.0910	0.5471	0.1400	+90 +35
W. iv, 650	6	1.35	2.4	20 27.7	17 5.1	-9 25.0	+0.0485	0.5478	0.1321	+43 -25
ϵ Tauri	5	1.27	1.5	21 25.8	23 4 26.3	+1 33.3	+0.3790	0.5483	0.1095	+64 -6
105 Tauri	6	-1.26	-1.3	+21 33.6	6 38.6	+3 41.2	+0.4746	0.5495	+0.1052	+72 +1
108 Tauri	6 $\frac{1}{2}$	1.23	0.9	22 9.6	10 4.2	+6 59.9	+0.1736	0.5502	0.0987	+51 -15
α Tauri	5 $\frac{1}{2}$	1.22	0.8	21 59.0	11 48.7	+8 40.8	+0.5345	0.5509	0.0949	+77 +5
σ Tauri	6	1.18	-0.7	21 50.5	15 37.3	-11 34.3	+1.0360	0.5504	0.0969	+90 +36
121 Tauri	6	1.17	+0.1	23 57.9	19 7.5	-9 15.2	-0.9817	0.5509	0.0799	-19 -66
B. A. C. 1801	6	-1.12	+0.1	+23 9.2	22 43.4	-4 46.7	+0.1764	0.5514	+0.0724	+51 -12
132 Tauri	5 $\frac{1}{2}$	1.01	0.3	24 31.8	23 1 16.5	-2 18.8	-1.1470	0.5514	0.0672	-35 -65
1 Geminorum	5	1.03	0.2	23 16.1	8 9.8	+4 20.5	+0.6387	0.5514	0.0523	+89 +15
2 Geminorum	7	1.03	0.6	23 38.8	9 22.6	+5 30.8	+0.2847	0.5512	0.0490	+58 -5
3 Geminorum	6 $\frac{1}{2}$	0.99	0.7	23 7.8	10 42.8	+6 48.2	+0.9143	0.5509	0.0466	+90 +32
5 Geminorum	6 $\frac{1}{2}$	-0.99	+0.7	+24 26.6	11 30.4	+7 34.2	-0.4891	0.5509	+0.0442	+12 -48
6 Geminorum	6 $\frac{1}{2}$	0.98	0.8	22 55.9	11 53.6	+7 56.6	+1.1840	0.5509	0.0438	+90 +53
9 Geminorum	6 $\frac{1}{2}$	0.96	0.9	23 46.7	13 59.5	+9 58.3	+0.3455	0.5509	0.0392	+62 0
ϵ Geminorum	3 $\frac{1}{2}$	0.84	1.9	25 14.4	24 2 13.2	-2 12.9	-0.9415	0.5493	+0.0128	-17 -65
ω Geminorum	5 $\frac{1}{2}$	0.72	2.5	24 22.2	10 40.9	+5 57.7	+0.0440	0.5480	-0.0055	+43 -13
48 Geminorum	6	-0.66	+2.4	+24 18.8	15 17.0	+10 24.4	+0.0570	0.5476	-0.0153	+43 -13
52 Geminorum	6 $\frac{1}{2}$	0.66	2.6	25 4.5	16 17.9	+11 23.3	-0.7996	0.5476	0.0174	-7 -65
A Geminorum	5 $\frac{1}{2}$	0.61	2.8	25 15.6	20 20.4	-8 42.3	-1.0940	0.5465	0.0257	-30 -65
58 Geminorum	6 $\frac{1}{2}$	0.60	2.2	23 9.3	20 23.0	-8 39.8	+1.2260	0.5463	0.0266	+90 +59
κ Geminor. mult.	3 $\frac{1}{2}$	0.48	2.9	24 39.7	25 6 3.4	+0 41.2	-0.7902	0.5444	0.0466	-6 -65
82 Geminorum	6 $\frac{1}{2}$	-0.46	+2.5	+23 24.7	7 59.8	+2 33.8	+0.4955	0.5439	-0.0507	+74 +7
84 Geminorum	6 $\frac{1}{2}$	0.42	2.3	22 36.9	10 5.4	+4 35.2	+1.2660	0.5432	0.0548	+90 +63
7 Cancri	6 $\frac{1}{2}$	0.37	2.2	22 22.7	15 9.6	+9 29.4	+1.2230	0.5416	0.0650	+90 +56
μ Cancri	6 $\frac{1}{2}$	0.32	2.4	22 57.0	16 18.2	+10 35.7	+0.5139	0.5415	0.0672	+75 +7
γ Cancri	4 $\frac{1}{2}$	-0.13	2.3	21 51.9	26 9 51.9	+3 35.2	+0.2266	0.5359	0.1015	+54 -13
B. A. C. 3206	6 $\frac{1}{2}$	+0.11	+1.8	+20 15.8	27 6 0.7	-0 54.4	-0.4081	0.5293	-0.1365	+18 -51
η Leonis	3 $\frac{1}{2}$	0.34	+0.4	17 17.9	28 3 13.1	-4 21.2	-0.3465	0.5237	0.1686	+19 -54
42 Leonis	6	0.42	-0.3	15 31.8	10 34.0	+2 45.3	+0.2797	0.5224	0.1786	+57 -19
ϵ Leonis	5 $\frac{1}{2}$	0.46	0.5	14 42.0	15 50.0	+7 52.8	+0.2289	0.5212	0.1553	+54 -22
ι Leonis mult.	4	0.70	2.3	11 8.0	29 18 24.5	+9 39.8	-1.1900	0.5170	0.2130	-31 -79
ξ Virginis	6	+0.71	-3.1	+8 44.5	30 1 56.5	-7 1.8	-0.2319	0.5166	-0.2191	+25 -52
ζ Virginis	5 $\frac{1}{2}$	0.77	3.1	8 52.1	5 27.9	-3 36.4	-1.1440	0.5166	0.2216	+26 -81
ν Virginis	4	0.77	3.6	7 8.7	5 46.2	-3 18.7	+0.6463	0.5168	0.2219	+84 -5
π Virginis	4 $\frac{1}{2}$	0.83	4.8	7 13.5	13 31.6	+4 13.0	-1.1800	0.5176	0.2275	-29 -81
ϵ Virginis	5 $\frac{1}{2}$	+0.89	-4.8	+3 55.4	23 34.6	-10 2.0	+0.0445	0.5184	-0.2325	+13 -37

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 4254	6	+0.95	-5.0	+ 27.6	1 8 47.7	- 1 5.4	-0.5533	0.5212	-0.2360	+11°	-74°
65 Virginis	6	1.08	6.2	- 4 21.0	2 7 23.9	- 3 10.2	+1.2660	0.5283	0.2380	+86	+37
κ Virginis	4½	1.19	6.4	9 45.8	3 7 25.3	- 3 54.3	+1.2650	0.5408	0.2294	+80	+38
ν Libræ	6½	1.17	5.6	15 9.1	4 14 28.9	+ 2 6.5	+0.0955	0.5614	0.1990	+39	-35
α Libræ	6½	1.25	5.6	14 44.6	15 22.2	+ 2 57.9	-0.4999	0.5618	0.1978	+ 8	-72
ζ Libræ	6	+1.26	-5.4	-16 20.0	17 37.9	+ 5 8.8	+0.6829	0.5631	-0.1945	+73	- 3
ζ^2 Libræ	6	1.26	5.1	16 13.9	18 41.1	+ 6 9.8	+0.3747	0.5641	0.1930	+54	-20
ζ^4 Libræ	5½	1.26	5.3	16 28.8	19 39.5	+ 7 6.2	+0.4412	0.5650	0.1918	+59	-16
β Scorpii	2	1.27	4.4	19 30.3	5 9 27.8	- 3 35.6	+1.0300	0.5748	0.1683	+70	+21
β^2 Scorpii	5½	1.27	4.4	19 30.1	9 27.9	- 3 35.5	+1.0270	0.5748	0.1683	+70	+20
ν^2 Scorpii	4½	+1.26	-4.3	-19 10.6	12 12.4	- 0 57.1	+0.2402	0.5761	-0.1631	+43	-27
ψ Ophiuchi	4½	1.25	3.8	19 46.9	17 12.1	+ 3 51.3	+0.0626	0.5805	0.1537	+32	-37
ω Ophiuchi	4½	1.24	3.5	21 13.9	20 27.6	+ 6 59.4	+1.0440	0.5818	0.1467	+69	+22
b Ophiuchi	5	1.16	1.6	24 4.4	6 18 1.5	+ 3 42.8	+1.2770	0.5943	0.0961	+66	+56
c^2 Ophiuchi	5	1.14	1.4	23 52.6	19 59.9	+ 5 36.5	+0.8958	0.5953	0.0916	+66	+12
63 Ophiuchi	6½	+1.11	-0.6	-24 51.9	7 5 4.3	- 9 41.0	+1.1750	0.5997	-0.0669	+65	+38
4 Sagittarii	5½	1.08	0.7	23 48.3	6 58.3	- 7 51.7	-0.0168	0.5997	0.0615	+19	-41
7 Sagittarii	6	1.06	0.6	24 16.8	8 8.7	- 6 44.1	+0.3909	0.5997	0.0584	+42	-18
P. xvii, 330	5½	1.06	0.8	23 8.4	8 27.6	- 6 26.0	-0.7736	0.5999	0.0576	-22	-90
9 Sagittarii	6	1.07	0.5	24 21.8	8 31.7	- 6 22.0	+0.4530	0.5999	0.0572	+46	-15
P. xvii, 334	5½	+1.05	-0.9	-22 50.5	8 34.8	- 6 19.1	-1.0800	0.5999	-0.0572	-43	-90
B. A. C. 6161	5½	1.02	-0.5	23 43.5	11 32.9	- 3 28.2	-0.3507	0.6008	0.0490	0	-63
λ Sagittarii	3	0.97	+0.3	25 28.9	17 43.3	+ 2 27.0	+1.1710	0.6019	0.0315	+65	+37
24 Sagittarii	6	0.93	0.1	24 6.8	20 0.0	+ 4 38.0	-0.2718	0.6025	0.0252	+ 3	-57
25 Sagittarii	6½	0.93	0.2	24 18.3	20 14.9	+ 4 52.4	-0.0856	0.6025	0.0243	+12	-45
B. A. C. 6343	6½	+0.92	+0.2	-23 35.9	21 46.1	+ 6 19.8	-0.8307	0.6025	-0.0200	-29	-90
26 Sagittarii	6½	0.90	0.3	23 56.1	23 2.2	+ 7 32.7	-0.5151	0.6027	0.0164	-12	-76
B. A. C. 6369	6	0.94	0.7	25 7.2	8 0 8.6	+ 8 36.4	+0.6627	0.6027	0.0133	+59	- 2
B. A. C. 6448	6	0.86	0.5	23 18.8	4 25.9	-11 16.9	-1.1880	0.6026	-0.0010	-57	-90
ψ Sagittarii	5½	0.78	1.5	25 26.7	11 49.6	- 4 11.4	+1.0300	0.6019	+0.0201	+65	+24
χ^1 Sagittarii	5½	+0.73	+1.5	-24 43.3	15 33.3	- 0 36.9	+0.3977	0.6009	+0.0305	+40	-18
χ^2 Sagittarii	6½	0.73	1.4	24 37.6	15 35.8	- 0 34.5	+0.3020	0.6009	0.0307	+34	-23
χ^3 Sagittarii	5½	0.72	1.3	24 10.7	15 39.2	- 0 31.1	-0.1477	0.6009	0.0310	+10	-49
k^1 Sagittarii	6	0.67	1.8	24 57.6	19 40.1	+ 3 19.9	+0.7868	0.6002	0.0423	+65	+ 6
k^2 Sagittarii	4½	0.67	1.8	25 7.5	19 55.4	+ 3 34.6	+0.9647	0.5999	0.0429	+65	+18
53 Sagittarii	6½	+0.64	+1.5	-23 40.6	21 8.8	+ 4 45.0	-0.4396	0.5995	+0.0436	- 5	-69
B. A. C. 6727	6	0.64	1.5	23 40.8	21 15.6	+ 4 51.5	-0.4312	0.5995	0.0466	- 5	-69
4 Capricorni	6	0.45	2.1	22 8.9	9 11 57.8	- 5 2.0	-0.9931	0.5939	0.0864	-34	-90
17 Capricorni	6	0.29	1.7	21 54.8	23 4.9	- 5 38.7	-0.1145	0.5884	0.1139	+18	-47
η Capricorni	5	0.21	1.3	20 17.4	10 6 26.2	-11 17.0	-0.8513	0.5840	0.1313	-20	-90
χ Capricorni	5½	+0.19	+1.9	-21 38.1	8 6.0	- 9 41.2	+0.7300	0.5829	+0.1350	+69	+ 1
27 Capricorni	6½	0.19	1.6	20 59.8	8 30.4	- 9 17.7	+0.1400	0.5822	0.1359	+34	-32
ϕ Capricorni	5½	0.15	1.9	21 6.5	10 59.3	- 6 54.5	+0.5952	0.5808	0.1414	+63	- 7
37 Capricorni	6	0.03	1.7	20 34.5	18 55.9	+ 0 44.1	+1.2460	0.5760	0.1578	+69	+43
ϵ Capricorni	4½	+0.01	1.7	19 57.5	19 51.9	+ 1 38.1	+0.7686	0.5751	0.1595	+70	+ 3
κ Capricorni	5	-0.02	+1.5	-19 22.0	22 11.9	+ 3 52.8	+0.5473	0.5733	+0.1628	+62	-10
20 Aquarii	6½	0.12	+0.8	17 29.6	11 6 36.0	+11 58.4	+0.0897	0.5674	0.1790	+36	-35
56 Aquarii	6½	0.27	-0.2	15 8.8	18 42.5	- 0 21.1	-0.0103	0.5605	0.1982	+34	-41
τ^1 Aquarii	5½	0.35	0.3	14 38.1	12 26.6	+ 7 6.8	+1.0420	0.5551	0.2083	+75	+20
τ^2 Aquarii	4	0.36	0.5	14 10.4	3 17.5	+ 7 55.9	+0.7482	0.5545	0.2092	+74	0
74 Aquarii	6	-0.38	-0.9	-12 12.1	5 2.4	+ 9 37.2	-0.8978	0.5530	+0.2112	-13	-90
ψ^1 Aquarii	4	0.50	1.9	9 41.2	15 13.8	- 4 32.1	-1.2610	0.5478	0.2221	-41	-90
ψ^2 Aquarii	4	0.51	1.8	9 47.0	16 10.5	- 3 37.4	-0.9521	0.5474	0.2230	-15	-90
ψ^3 Aquarii	4½	0.52	1.9	10 12.7	16 39.5	- 3 9.3	-0.4060	0.5471	0.2235	+16	-65
B. A. C. 8274	7	0.64	2.7	6 59.5	13 6 27.7	+10 11.5	-0.5524	0.5415	0.2343	+10	-76
30 Piscium	4½	-0.71	-2.7	- 6 37.7	12 49.0	- 7 39.6	+0.5720	0.5391	+0.2375	+75	-10
33 Piscium	5	0.71	-2.9	- 6 19.5	14 25.8	- 6 5.9	+0.6443	0.5384	+0.2381	+81	- 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$							
B. A. C. 17	6	-0.76	-3.2	-5 51.6	13 16 48.4	-3 47.9	+0.7336	0.5373	+0.2389	+83 - 0
14 Ceti	6	0.85	4.2	1 6.7	14 4 56.6	+7 57.1	-1.2530	0.5337	0.2420	-36 -90
15 Ceti	6½	0.86	4.3	-1 6.7	6 10.7	+9 8.8	-0.9552	0.5337	0.2425	-12 -90
26 Ceti	6	0.97	4.6	+0 46.5	18 41.9	-2 43.7	+0.1230	0.5320	0.2422	+47 -33
29 Ceti	6½	0.98	4.8	1 25.0	20 43.8	-0 45.5	-0.0537	0.5314	0.2417	+37 -43
33 Ceti	6	-0.99	-4.9	+1 51.6	21 59.8	+0 28.1	-0.2083	0.5314	+0.2417	+29 -52
35 Ceti	6½	1.00	4.8	1 53.3	22 57.7	+1 24.1	-0.0051	0.5314	0.2414	+40 -40
f Piscium	5	1.01	4.4	3 2.0	15 1 32.2	+3 53.9	-0.5764	0.5307	0.2406	+10 -77
v Piscium	4½	1.09	5.1	4 55.7	13 6.2	-8 53.9	+0.2060	0.5317	0.2367	+52 -28
64 Ceti	5½	1.15	5.2	8 3.2	16 3 43.3	+5 15.9	+0.3245	0.5328	0.2276	+59 -22
ξ Ceti	4½	-1.18	-5.2	+8 19.7	4 30.9	+6 1.9	+0.2123	0.5328	+0.2269	+52 -27
ξ Arietis	5	1.16	5.3	10 6.6	10 15.0	+11 35.2	-0.3744	0.5332	0.2220	+20 -59
B. A. C. 755	6½	1.18	5.3	10 4.0	11 11.6	-11 30.0	-0.1212	0.5334	0.2211	+34 -45
31 Arietis	5½	1.25	5.3	11 58.2	15 56.6	-6 53.9	-1.0900	0.5341	0.2168	-22 -78
38 Arietis	5	1.26	5.1	11 58.9	19 58.9	-2 59.4	-0.2381	0.5352	0.2126	+28 -50
NEW MOON.										
ε Tauri	3½	-1.36	-2.9	+18 56.1	18 20 51.3	-3 42.2	+1.1580	0.5470	+0.1415	+90 +40
ι Tauri	5	1.34	1.7	21 25.9	19 12 37.7	+11 32.6	+0.4647	0.5511	0.1114	+71 - 1
105 Tauri	6	1.33	1.5	21 33.6	14 49.5	-10 19.8	+0.5641	0.5513	0.1069	+80 + 6
108 Tauri	6½	-1.32	-1.2	+22 9.6	18 14.8	-7 1.7	+0.2663	0.5521	+0.1000	+57 -10
α Tauri	5½	1.31	1.1	21 59.0	19 59.1	-5 21.0	+0.6304	0.5521	0.0964	+87 +10
ο Tauri	6	1.29	0.9	21 50.5	23 46.9	-1 40.9	+1.1360	0.5529	0.0884	+90 +45
121 Tauri	6	1.29	0.3	23 57.9	20 3 16.5	+1 41.4	-0.8784	0.5529	0.0810	-11 -66
B. A. C. 1801	6	1.26	-0.2	23 9.2	6 51.0	+5 8.7	+0.2800	0.5534	0.0734	+58 - 7
132 Tauri	5½	-1.26	0.0	+24 31.8	9 24.0	+7 36.4	-1.0440	0.5538	+0.0681	-24 -65
1 Geminorum	5	1.21	+0.4	23 16.1	16 15.2	-9 46.3	+0.7537	0.5538	0.0531	+90 +21
2 Geminorum	7	1.21	0.5	23 38.8	17 27.7	-8 36.3	+0.4015	0.5538	0.0505	+67 + 2
3 Geminorum	6½	1.18	0.5	23 7.8	18 47.5	-7 19.3	+1.0330	0.5536	0.0474	+90 +40
5 Geminorum	6½	1.19	0.8	24 26.6	19 34.6	-6 33.8	-0.3687	0.5535	0.0458	+20 -40
9 Geminorum	6½	-1.17	+0.9	+23 46.7	22 3.1	-4 10.4	+0.4654	0.5530	+0.0404	+72 + 7
7 Geminorum	3½	1.10	1.8	+25 14.4	21 10 12.5	+7 34.1	-0.8097	0.5522	0.0150	-7 -65
37 Geminorum	6½	1.06	2.2	25 30.7	15 22.0	-11 26.8	-1.0680	0.5518	+0.0022	-27 -64
ω Geminorum	5½	1.01	2.2	24 22.2	18 37.3	-8 18.2	+0.1817	0.5508	-0.0050	+51 - 6
48 Geminorum	6	0.96	2.5	24 18.8	23 11.6	-3 53.2	+0.1986	0.5502	0.0150	+52 - 6
52 Geminorum	6½	-0.96	+2.7	+25 4.5	22 0 12.3	-2 54.6	-0.6582	0.5499	-0.0173	+3 -59
A Geminorum	5½	0.92	2.9	25 15.6	4 13.6	+0 58.6	-0.9486	0.5487	0.0259	-17 -65
κ Geminor. mult	3½	0.82	3.2	24 39.7	13 53.6	+10 19.2	-0.6409	0.5463	0.0465	+4 -59
82 Geminorum	6½	0.79	2.9	23 24.7	15 49.5	-11 48.8	+0.6183	0.5454	0.0505	+90 +15
μ Cancri	6½	0.69	3.1	22 57.0	23 0 5.8	-3 48.9	+0.6717	0.5434	0.0674	+90 +15
γ Cancri	4½	-0.49	+3.4	+21 51.9	17 38.1	-10 50.9	+0.3876	0.5364	-0.1013	+65 - 5
B. A. C. 3138	6½	0.33	3.6	21 44.2	24 8 19.3	+3 22.4	-1.1520	0.5307	0.1272	-33 -68
B. A. C. 3206	6½	0.25	3.1	20 15.8	13 49.2	+8 41.9	-0.2417	0.5287	0.1364	+27 -41
η Leonis	3½	-0.01	2.1	17 17.9	23 11 9.8	+5 23.3	-0.2206	0.5208	0.1679	+28 -44
42 Leonis	6	+0.08	1.7	15 31.8	18 34.7	-11 25.2	+0.4460	0.5187	0.1776	+68 -10
ι Leonis	5½	+0.14	+1.4	+14 42.0	23 54.4	-6 15.1	+0.3957	0.5170	-0.1840	+64 -13
k Leonis	5	0.21	+1.3	14 46.5	26 7 15.6	+0 53.1	-1.0730	0.5151	0.1926	-22 -75
ι Leonis mult.	4	0.41	0.0	11 8.1	27 2 49.9	-4 7.0	-1.0470	0.5121	0.2116	-19 -79
ζ Virginis	6	0.50	-1.2	8 44.6	10 28.7	+3 18.4	-0.0870	0.5121	0.2180	+36 -43
ξ Virginis	5½	0.53	1.1	8 52.2	14 3.8	+6 47.3	-1.0070	0.5113	0.2202	-16 -81
ν Virginis	4	+0.53	-1.7	+7 8.8	14 22.3	+7 5.3	+0.7905	0.5113	-0.2205	+90 + 4
π Virginis	4½	0.62	1.9	7 13.5	22 15.2	-9 15.5	-1.0510	0.5119	0.2255	-19 -83
11 Virginis	6	0.65	2.1	6 25.0	28 3 4.6	-4 34.7	-1.2710	0.5120	0.2284	-38 -84
c Virginis	5	0.70	3.0	3 55.4	8 27.9	+0 39.2	+0.1753	0.5132	0.2308	+50 -31
B. A. C. 4254	6	0.79	3.4	+2 27.6	17 49.6	+9 44.5	-0.4377	0.5151	0.2342	+17 -67
65 Virginis	6	+0.80	-5.3	-4 21.0	29 16 44.7	+7 58.5	+1.3640	0.5240	-0.2372	+6 +51
80 Virginis	6	+1.06	-5.3	-4 50.2	22 50.0	-10 7.4	+0.4304	0.5271	-0.2364	+65 -18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		$^{\circ}$	$''$		$^{\circ}$	$^{\circ}$				$^{\circ}$	$^{\circ}$	
88 Virginis	6½	+1.11	-5.6	- 6 17.4	30 5 7.8	- 4 12	+0.4686	0.5298	-0.2345	+68	-16	
B. A. C. 4647	6½	1.12	5.8	7 31.1	8 23.0	- 0 52.2	+0.9910	0.5319	0.2335	+82	+14	
94 Virginis	6½	1.18	5.9	8 22.1	13 50.6	+ 4 25.0	+0.6025	0.5362	0.2315	+76	- 8	
95 Virginis	6	+1.19	-6.1	- 8 47.4	14 2.9	+ 4 37.0	+0.9947	0.5357	-0.2310	+81	+15	

JUNE.

ζ ¹ Libræ	6	+1.49	-5.9	-16 20.0	1 3 11.0	- 7 30.1	+0.6982	0.5641	-0.1961	+74	- 2	
ζ ² Libræ	6	1.50	5.7	16 13.9	4 13.8	- 6 29.5	+0.3915	0.5650	0.1945	+55	-19	
ζ ⁴ Libræ	5½	1.51	5.7	16 28.8	5 11.8	- 5 33.5	+0.4559	0.5665	0.1932	+59	-16	
β ¹ Scorpii	2	+1.60	-5.1	-19 30.3	18 51.9	+ 7 36.5	+1.0230	0.5778	-0.1707	+70	+20	
β ² Scorpii	5½	1.60	5.1	19 30.1	18 52.0	+ 7 36.6	+1.0200	0.5778	0.1707	+70	+20	
γ ² Scorpii	4½	1.60	4.8	19 10.6	21 34.3	+10 12.8	+0.2369	0.5800	0.1656	+43	-27	
ψ Ophiuchi	4½	1.64	4.4	19 46.9	2 29.6	- 9 3.2	+0.0570	0.5845	0.1559	+32	-37	
ω Ophiuchi	4½	1.66	4.1	21 13.9	5 42.1	- 5 58.1	+1.0260	0.5867	0.1489	+68	+21	
b Ophiuchi	var.	5	+1.74	-2.0	-24 4.5	3 2 50.1	- 9 40.7	+1.2290	0.6025	-0.0982	+66	+45
c ¹ Ophiuchi	5	1.73	1.8	23 52.7	4 45.6	- 7 49.9	+0.8521	0.6026	0.0930	+66	+ 9	
63 Ophiuchi	6½	1.72	0.8	24 51.9	13 36.4	+ 0 38.9	+1.1160	0.6070	0.0686	+65	+30	
4 Sagittarii	5½	1.70	0.7	23 48.3	15 27.6	+ 2 25.4	-0.0614	0.6080	0.0636	+18	-45	
7 Sagittarii	6	1.70	0.5	24 16.8	16 35.6	+ 3 30.6	+0.3416	0.6084	0.0603	+39	-21	
P. xvii, 330	5½	+1.70	-0.4	-23 8.4	16 54.4	+ 3 48.7	-0.8093	0.6085	-0.0594	-24	-90	
9 Sagittarii	6	1.70	0.3	24 21.8	16 58.5	+ 3 52.6	+0.4014	0.6085	0.0590	+43	-18	
P. xvii, 334	5½	1.68	-0.5	22 50.5	17 1.4	+ 3 55.3	-1.1160	0.6087	0.0588	-45	-90	
B. A. C. 6161	5½	1.68	+0.1	23 43.5	19 54.8	+ 6 41.5	+0.3947	0.6099	0.0508	- 3	-69	
λ Sagittarii	3	1.69	0.6	25 28.9	4 1 54.8	-11 33.7	+1.1010	0.6109	0.0329	+65	+30	
24 Sagittarii	6	+1.65	+0.7	-24 6.8	4 8.1	- 9 26.1	-0.3245	0.6115	-0.0261	- 1	-61	
25 Sagittarii	6½	1.66	0.7	24 18.3	4 22.0	- 9 12.7	-0.1391	0.6118	0.0235	+ 9	-49	
B. A. C. 6343	6½	1.63	0.8	23 35.9	5 50.7	- 7 47.8	-0.8726	0.6123	0.0210	-32	-90	
26 Sagittarii	6½	1.63	1.0	23 56.1	7 4.5	- 6 37.2	-0.5645	0.6121	0.0176	-14	-81	
B. A. C. 6369	6	1.61	1.3	25 7.2	8 9.1	- 5 35.3	+0.5943	0.6122	-0.0142	+53	- 6	
ψ Sagittarii	5½	+1.56	+2.6	-25 26.7	19 29.1	+ 5 15.8	+0.9486	0.6120	+0.0198	+65	+17	
χ ¹ Sagittarii	5½	1.52	2.8	24 43.3	23 6.1	+ 8 43.6	+0.3196	0.6112	0.0306	+35	-22	
χ ² Sagittarii	6½	1.52	2.8	24 37.6	23 8.6	+ 8 46.1	+0.2268	0.6112	0.0308	+29	-27	
χ ³ Sagittarii	5½	1.50	2.8	24 10.7	23 11.8	+ 8 49.2	-0.2185	0.6112	0.0310	+ 6	-54	
h ¹ Sagittarii	6	1.52	3.3	24 57.6	3 3 5.4	-11 27.1	+0.7003	0.6101	0.0425	+64	0	
h ² Sagittarii	4½	+1.52	+3.4	-25 7.5	3 20.2	-11 13.0	+0.8726	0.6101	+0.0432	+65	+11	
53 Sagittarii	6½	1.49	3.2	23 40.6	4 31.4	-10 4.8	-0.5000	0.6096	0.0465	- 8	-74	
B. A. C. 6727	6	1.49	3.2	23 40.8	4 38.1	- 9 58.3	-0.4983	0.6095	0.0472	- 8	-74	
4 Capricorni	6	1.30	4.1	22 8.9	18 53.9	+ 3 41.7	-1.0590	0.6036	0.0872	-39	-90	
17 Capricorni	6	1.20	5.0	21 54.8	6 5 42.0	- 9 56.6	-0.1977	0.5967	0.1156	+14	-52	
η Capricorni	5	+1.09	+5.0	-20 17.4	12 51.3	- 3 4.4	-0.9284	0.5915	+0.1327	-25	-90	
χ Capricorni	5½	1.07	5.4	21 38.1	14 28.6	- 1 31.1	+0.6333	0.5908	0.1369	+65	- 5	
27 Capricorni	6½	1.06	5.2	20 59.8	14 52.3	- 1 8.3	+0.0500	0.5908	0.1377	+29	-38	
φ Capricorni	5½	1.03	5.5	21 6.5	17 17.6	+ 1 11.2	+0.5017	0.5885	0.1430	+56	-13	
33 Capricorni	5½	0.98	5.8	21 19.2	20 42.4	+ 4 28.1	+1.2150	0.5860	0.1506	+69	+39	
37 Capricorni	6	+0.95	+5.8	-20 34.5	7 1 2.5	+ 8 38.2	+1.1420	0.5825	+0.1592	+69	+31	
ε Capricorni	4½	0.93	5.7	19 57.5	1 57.2	+ 9 30.8	+0.6711	0.5872	0.1612	+69	- 3	
κ Capricorni	5	0.90	5.7	19 22.0	4 14.0	+11 42.4	+0.4515	0.5834	0.1657	+56	-13	
29 Aquarii	mult.	6½	0.77	5.4	17 29.6	- 4 22.6	-0.0050	0.5734	0.1812	+31	-41	
56 Aquarii	6½	0.62	4.9	15 8.8	8 0 21.5	+ 7 5.3	-0.1027	0.5642	0.1995	+28	-46	
γ ¹ Aquarii	mult.	5½	+0.51	+4.9	-14 38.1	7 59.2	- 9 33.3	+0.9408	0.5481	+0.2096	+75	+12
γ ² Aquarii	4	0.50	4.7	14 10.4	8 49.4	- 8 44.8	+0.6486	0.5475	0.2105	+74	- 6	
74 Aquarii	6	0.48	4.3	12 12.1	10 33.5	- 7 4.3	-0.9831	0.5468	0.2128	-19	-90	
ψ ¹ Aquarii	4	0.33	3.5	9 41.2	20 38.6	+ 2 40.0	-1.3480	0.5493	0.2229	-54	-90	
ψ ² Aquarii	4	0.32	3.4	9 47.0	21 34.9	+ 3 34.3	-1.0390	0.5484	0.2238	-22	-90	
ψ ³ Aquarii	4½	+0.32	+3.5	-10 12.7	22 3.6	+ 4 2.1	-0.4957	0.5480	+0.2242	+12	-71	
B. A. C. 8274	7	+0.16	+2.7	- 6 59.5	9 11 47.8	- 6 41.1	-0.6393	0.5407	+0.2341	+ 6	-84	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1800.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
30 Piscium	4 $\frac{1}{2}$	+0.08	+2.8	- 6 37.6	9 18 8.7	- 0 32.6	+0.4838	0.5382	+0.2369	+68	-15
33 Piscium	5	0.06	2.6	6 19.4	19 45.5	+ 1 1.1	+0.5541	0.5371	0.2380	+74	-11
B. A. C. 17	6	+0.03	2.3	5 51.5	22 8.2	+ 3 19.2	+0.6426	0.5365	0.2390	+81	- 6
14 Ceti	6	-0.09	1.0	1 6.6	10 10 19.1	- 8 53.1	-1.3370	0.5317	0.2416	-46	-90
15 Ceti	6 $\frac{1}{2}$	0.10	0.9	- 1 6.6	11 33.4	- 7 41.1	-1.0380	0.5309	0.2416	-18	-90
26 Ceti	6	-0.22	+0.6	+ 0 46.6	11 0 10.4	+ 4 32.2	+0.0469	0.5278	+0.2410	+43	-38
29 Ceti	6 $\frac{1}{2}$	0.25	+0.2	1 25.1	2 13.8	+ 6 31.8	-0.1270	0.5279	0.2410	+34	-47
33 Ceti	6	0.26	0.0	1 51.7	3 30.2	+ 7 45.8	-0.2835	0.5273	0.2403	+25	-57
35 Ceti	6 $\frac{1}{2}$	0.27	+0.3	1 53.4	4 28.6	+ 8 42.4	-0.0801	0.5273	0.2403	+36	-45
f Piscium	5	0.30	-0.2	3 2.1	7 4.8	+11 13.8	-0.6498	0.5272	0.2395	+ 6	-83
g Piscium	4 $\frac{1}{2}$	-0.22	-0.6	+ 4 55.8	18 47.1	- 1 25.4	+0.1400	0.5266	+0.2345	+48	-32
64 Ceti	5 $\frac{1}{2}$	0.54	1.2	8 3.3	9 36.3	-11 3.7	+0.2699	0.5278	0.2361	+56	-24
ξ Ceti	4 $\frac{1}{2}$	0.55	1.3	8 19.8	10 24.6	-10 17.0	+0.1605	0.5278	0.2354	+49	-30
ξ Arietis	5 $\frac{1}{2}$	0.61	1.8	10 6.7	16 13.8	- 4 38.6	-0.4293	0.5280	0.2205	+18	-63
B. A. C. 755	6 $\frac{1}{2}$	0.62	1.8	10 4.1	17 11.4	- 3 42.8	-0.1732	0.5280	0.2196	+31	-47
31 Arietis	5 $\frac{1}{2}$	-0.66	-2.2	+11 58.3	22 0.7	+ 0 57.6	-1.1440	0.5288	+0.2153	-27	-78
38 Arietis	5	0.68	1.9	11 59.0	13 2 6.9	+ 4 56.1	-0.2837	0.5289	0.2112	+25	-53
Lalande 5725	6	0.76	1.9	12 46.0	12 34.8	- 8 55.7	+1.0350	0.5329	0.1999	+90	+23
B. A. C. 1119	6	0.86	2.1	16 10.7	14 4 27.8	+ 6 27.1	+0.3943	0.5370	0.1786	+64	-12
B. A. C. 1206	6	0.90	2.0	16 59.9	10 59.8	-11 13.5	+0.6481	0.5391	0.1689	+87	+ 3
B. A. C. 1240	6	-0.93	-2.1	+17 53.0	14 36.4	- 7 43.9	+0.2949	0.5379	+0.1633	+58	-16
ω ¹ Tauri	6	0.96	2.1	19 19.0	18 31.5	- 3 56.5	-0.6269	0.5419	0.1571	+ 6	-67
ω ² Tauri	5 $\frac{1}{2}$	0.98	2.0	20 18.4	22 19.4	- 0 16.0	-1.1120	0.5424	0.1504	-28	-70
NEPTUNE				19 35.8	23 37.2	+ 0 59.3	-0.1498	0.5420	0.1482	+32	-37
ε Tauri	3 $\frac{1}{2}$	0.97	-1.5	18 56.2	15 3 39.4	+ 4 53.5	+1.1500	0.5440	0.1412	+90	+39
NEW MOON.											
ε Geminorum	3 $\frac{1}{2}$	-1.03	+1.5	+25 14.4	17 17 21.8	- 7 28.9	-0.7996	0.5535	+0.0138	- 7	-65
ω Geminorum	5 $\frac{1}{2}$	0.96	1.9	24 22.2	18 1 46.8	+ 0 38.9	+0.1970	0.5522	-0.0046	+52	- 5
48 Geminorum	6	0.95	2.2	24 18.8	6 21.1	+ 5 3.9	+0.2155	0.5514	0.0149	+54	- 5
52 Geminorum	6 $\frac{1}{2}$	-0.96	+2.3	+25 4.5	7 21.9	+ 6 2.7	-0.6428	0.5509	-0.0169	+ 3	-57
A Geminorum	5 $\frac{1}{2}$	0.94	2.5	25 15.6	11 23.0	+ 9 55.6	-0.9319	0.5498	0.0256	-16	-65
κ Geminorum mult.	3 $\frac{1}{2}$	0.88	3.0	24 39.7	21 2.8	- 4 44.0	-0.6219	0.5476	0.0463	+ 5	-58
82 Geminorum	6 $\frac{1}{2}$	0.86	2.8	23 24.7	22 58.4	- 2 52.3	+0.6639	0.5470	0.0505	+90	+16
μ ¹ Cancri	6 $\frac{1}{2}$	0.80	3.1	22 57.0	19 7 14.5	+ 5 7.4	+0.6932	0.5448	0.0674	+90	+16
γ Cancri	4 $\frac{1}{2}$	-0.66	+3.6	+21 51.9	20 0 45.9	- 1 55.4	+0.4123	0.5375	-0.1013	+67	- 3
B. A. C. 3138	6 $\frac{1}{2}$	0.53	4.0	21 44.2	15 27.4	-11 41.9	-1.1300	0.5319	0.1275	-31	-68
B. A. C. 3206	6 $\frac{1}{2}$	0.47	3.7	20 15.8	20 57.9	- 6 21.8	-0.2185	0.5296	0.1369	+28	-40
η Leonis	3 $\frac{1}{2}$	0.26	3.2	17 17.9	21 18 23.3	- 9 35.6	-0.1978	0.5204	0.1679	+30	-42
42 Leonis	6	0.19	3.0	15 31.8	22 1 51.2	- 2 21.1	+0.4724	0.5177	0.1774	+70	- 9
i Leonis	5 $\frac{1}{2}$	-0.13	+2.7	+14 42.0	7 13.2	+ 2 51.4	+0.4200	0.5153	-0.1834	+66	-12
k Leonis	5 $\frac{1}{2}$	-0.06	2.6	14 46.5	14 38.4	+10 3.5	-1.0550	0.5128	0.1918	-21	-75
l Leonis mult.	4	+0.14	1.6	11 8.1	23 10 27.4	+ 5 18.2	-1.0350	0.5083	0.2101	-18	-79
ω Virginis	6	0.22	0.6	8 44.6	18 13.5	-11 9.0	-0.0633	0.5080	0.2163	+37	-42
ξ Virginis	5 $\frac{1}{2}$	0.26	0.8	8 52.2	21 51.9	- 7 36.9	-0.9982	0.5074	0.2186	-16	-81
ν Virginis	4	+0.26	+0.1	+ 7 8.8	22 10.8	- 7 18.5	+0.8160	0.5074	-0.2190	+90	+ 6
π Virginis	4 $\frac{1}{2}$	0.34	0.0	7 13.6	24 6 12.2	+ 0 29.2	-1.0460	0.5074	0.2235	-18	-83
11 Virginis	6	0.38	-0.3	6 25.1	11 7.4	+ 5 15.6	-1.2700	0.5078	0.2261	-38	-84
c Virginis	5 $\frac{1}{2}$	0.46	1.2	3 55.5	16 36.8	+10 35.9	+0.1877	0.5075	0.2284	+51	-30
B. A. C. 4254	6	0.54	1.5	+ 2 27.6	25 2 10.4	- 4 6.9	-0.4280	0.5093	0.2318	+18	-66
65 Virginis	6	+0.79	-3.7	- 4 21.0	26 1 37.1	- 5 21.1	+1.3850	0.5166	-0.2341	+86	+57
80 Virginis	6	0.87	3.9	4 50.2	7 51.0	+ 0 41.6	+0.4434	0.5196	0.2332	+67	-17
88 Virginis	6 $\frac{1}{2}$	0.94	4.4	6 17.4	14 17.5	+ 6 56.4	+0.4906	0.5234	0.2319	+68	-15
B. A. C. 4647	6 $\frac{1}{2}$	0.98	4.6	7 31.1	17 37.2	+10 10.0	+1.0035	0.5249	0.2304	+82	+15
94 Virginis	6 $\frac{1}{2}$	1.05	4.9	8 22.1	23 12.1	- 8 25.5	+0.6148	0.5284	0.2286	+77	- 8
95 Virginis	6	+1.05	-5.0	- 8 47.4	23 24.6	- 8 13.4	+1.0090	0.5284	-0.2281	+81	+17
κ Virginis	4 $\frac{1}{2}$	+1.08	-5.1	- 9 45.8	27 2 24.9	- 5 18.7	+1.3440	0.5307	-0.2265	+80	+50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
α^1 Libræ	6 $\frac{1}{2}$	+1.45	-5.6	-15 9.1	28 10 4.6	+ 1 18.3	+0.1179	0.5567	-0.1988	+40°	-34°
α^2 Libræ	6 $\frac{1}{2}$	1.46	5.3	14 44.6	10 58.4	+ 2 10.3	-0.4768	0.5581	0.1976	+ 9	-71
ζ^1 Libræ	6	1.49	5.6	16 20.0	13 15.1	+ 4 22.2	+0.7047	0.5600	0.1947	+74	- 2
ζ^2 Libræ	7	1.51	5.8	17 3.8	13 49.7	+ 4 55.6	+1.3380	0.5598	0.1935	+73	+57
ζ^3 Libræ	6	1.51	5.6	16 13.9	14 18.9	+ 5 23.7	+0.3936	0.5603	0.1931	+56	-19
ζ^4 Libræ	5 $\frac{1}{2}$	+1.51	-5.5	-16 28.8	15 17.7	+ 6 20.5	+0.4582	0.5611	-0.1919	+59	-16
β^1 Scorpii	2	1.68	5.2	19 30.3	29 5 7.0	- 4 20.2	+1.0290	0.5747	0.1698	+70	+20
β^2 Scorpii	5 $\frac{1}{2}$	1.68	5.2	19 30.1	5 7.1	- 4 20.1	+1.0230	0.5747	0.1698	+70	+20
ν^2 Scorpii	4 $\frac{1}{2}$	1.70	4.9	19 10.6	7 50.9	- 1 42.5	+0.2378	0.5773	0.1647	+43	-27
ψ Ophiuchi	4 $\frac{1}{2}$	1.76	4.6	19 46.9	12 48.1	+ 3 3.4	+0.0555	0.5822	0.1551	+32	-37
ω Ophiuchi	4 $\frac{1}{2}$	+1.80	-4.5	-21 13.9	16 1.7	+ 6 9.5	+1.1024	0.5856	-0.1506	+69	+20
δ Ophiuchi	5	2.01	2.6	24 4.4	30 13 10.1	+ 2 27.4	+1.2280	0.5929	0.0982	+66	+45
ϵ Ophiuchi	5	+2.01	-2.4	-23 52.6	15 5.1	+ 4 17.7	+0.8476	0.6039	-0.0932	+66	+ 9

JULY.

4 Sagittarii	5 $\frac{1}{2}$	+2.08	-1.0	-23 48.3	1 1 42.2	- 9 31.8	-0.0577	0.6110	-0.0636	+17	-44	
P. xvii, 330	5 $\frac{1}{2}$	2.07	0.7	23 8.4	3 8.1	- 8 9.5	-0.8052	0.6122	0.0593	-28	-90	
B. A. C. 6161	5 $\frac{1}{2}$	2.09	-0.4	23 43.5	6 6.4	- 5 18.8	-0.3887	0.6134	0.0508	- 2	-65	
λ Sagittarii	3	2.14	+0.4	25 28.9	12 1.7	+ 0 21.3	+1.0980	0.6155	-0.0329	+65	+30	
ψ Sagittarii	5 $\frac{1}{2}$	+2.15	+2.9	-25 26.7	2 5 17.7	- 7 7.5	+0.9460	0.6176	+0.0203	+65	+17	
χ^1 Sagittarii	5 $\frac{1}{2}$	2.18	3.4	24 43.3	8 50.1	- 3 44.3	+0.3273	0.6176	0.0313	+36	-22	
χ^2 Sagittarii	6 $\frac{1}{2}$	2.13	3.4	24 37.6	8 52.4	- 3 42.1	+0.2357	0.6176	0.0313	+30	-27	
χ^3 Sagittarii	5 $\frac{1}{2}$	2.12	3.4	24 10.7	8 55.5	- 3 39.1	-0.2030	0.6176	0.0314	+ 7	-53	
κ^1 Sagittarii	6	2.12	4.0	24 57.6	12 43.9	- 0 0.6	+0.7053	0.6174	0.0432	+64	0	
κ^2 Sagittarii	4 $\frac{1}{2}$	+2.11	+4.0	-25 7.5	12 58.4	+ 0 13.5	+0.8788	0.6172	+0.0439	+65	+12	
53 Sagittarii	6 $\frac{1}{2}$	2.09	4.1	23 40.6	14 7.9	+ 1 19.8	-0.4895	0.6172	0.0474	- 8	-74	
B. A. C. 6727	6	2.09	4.1	23 40.8	14 14.4	+ 1 26.0	-0.4811	0.6172	0.0478	- 7	-73	
4 Capricorni	6	2.11	5.7	22 8.8	3 4 8.1	- 9 16.1	-1.0330	0.6130	0.0889	-37	-90	
17 Capricorni	6	1.92	7.0	21 54.7	14 37.4	+ 0 46.7	-0.1786	0.6073	0.1180	+15	-51	
η Capricorni	5	+1.84	+7.5	-20 17.3	21 33.8	+ 7 25.9	-0.8966	0.6013	+0.1352	-23	-90	
χ Capricorni	5 $\frac{1}{2}$	1.84	7.9	21 38.0	23 8.0	+ 8 56.2	+0.6426	0.6002	0.1386	+65	- 4	
27 Capricorni	6 $\frac{1}{2}$	1.82	7.8	20 59.7	23 30.9	+ 9 18.2	+0.0673	0.6008	0.1402	+30	-36	
ϕ Capricorni	5 $\frac{1}{2}$	1.83	8.2	21 6.4	4 1 51.6	+11 33.1	+0.5139	0.5985	0.1458	+57	-12	
33 Capricorni	5 $\frac{1}{2}$	1.77	8.5	21 19.1	5 10.1	- 9 16.3	+1.2170	0.5956	0.1532	+69	+39	
37 Capricorni	6	+1.74	+8.8	-20 34.4	9 21.9	- 5 14.6	+1.1450	0.5929	+0.1625	+69	+31	
ϵ Capricorni	4 $\frac{1}{2}$	1.73	8.7	19 57.4	10 14.9	- 4 23.7	+0.6810	0.5919	0.1642	+69	- 3	
κ Capricorni	5	1.75	8.8	19 21.9	12 27.3	- 2 16.5	+0.4661	0.5905	0.1690	+57	-15	
29 Aquarii	mult.	6 $\frac{1}{2}$	1.66	9.1	17 29.5	20 25.0	+ 5 22.6	+0.0214	0.5825	0.1841	+33	-39
56 Aquarii	6 $\frac{1}{2}$	1.35	9.1	15 8.7	5 7 56.0	- 7 32.5	-0.0730	0.5738	0.2032	+30	-45	
τ^1 Aquarii	mult.	5 $\frac{1}{2}$	+1.33	+9.5	-14 38.0	15 19.3	- 0 25.5	+0.9583	0.5675	+0.2131	+75	+14
τ^2 Aquarii	4	1.32	9.3	14 10.3	16 8.1	+ 0 21.5	+0.6705	0.5666	0.2142	+75	- 4	
74 Aquarii	6	1.30	9.0	12 12.0	17 48.8	+ 1 58.6	-0.9385	0.5658	0.2163	-16	-90	
ψ^1 Aquarii	4	1.21	8.7	9 41.1	6 3 36.1	+11 25.1	-1.2925	0.5581	0.2268	-45	-90	
ψ^2 Aquarii	4	1.20	8.7	9 46.9	4 30.7	-11 42.2	-0.9915	0.5565	0.2274	-18	-90	
ψ^3 Aquarii	4 $\frac{1}{2}$	+1.19	+8.8	-10 12.6	4 58.8	-11 15.1	-0.4538	0.5564	+0.2278	+14	-68	
B. A. C. 8274	7	1.10	8.1	6 59.4	18 20.9	+ 1 39.5	-0.5929	0.5483	0.2375	+ 8	-80	
30 Piscium	4 $\frac{1}{2}$	0.96	8.2	6 37.5	7 0 32.7	+ 7 39.0	+0.5187	0.5445	0.2403	+71	-13	
33 Piscium	5	0.94	8.0	6 19.3	2 7.2	+ 9 10.3	+0.5882	0.5432	0.2407	+77	- 9	
B. A. C. 17	6	0.91	7.9	5 51.4	4 26.6	+11 25.1	+0.6773	0.5421	0.2417	+83	- 5	
14 Ceti	6	+0.95	+6.6	- 1 6.5	16 22.3	- 1 2.5	-1.2800	0.5359	+0.2438	-38	-90	
15 Ceti	6 $\frac{1}{2}$	0.74	6.5	- 1 6.5	17 35.4	+ 0 8.2	-0.9845	0.5362	0.2440	-14	-90	
26 Ceti	6	0.63	6.1	+ 0 46.7	8 0.1	-11 50.7	+0.0931	0.5317	0.2430	+46	-35	
29 Ceti	6 $\frac{1}{2}$	0.60	5.8	1 25.2	8 1.8	- 9 52.8	-0.0810	0.5307	0.2420	+36	-45	
33 Ceti	6	0.58	5.5	1 51.8	9 17.2	- 8 39.8	-0.2367	0.5307	0.2420	+28	-53	
35 Ceti	6 $\frac{1}{2}$	+0.57	+5.8	+ 1 53.5	10 14.8	- 7 44.0	-0.0328	0.5304	+0.2416	+39	-42	
f Piscium	5	+0.54	+5.2	+ 3 2.2	12 49.0	- 5 14.6	-0.6020	0.5297	+0.2409	+ 9	-79	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
γ Piscium	4 $\frac{1}{2}$	+0.43	+4.9	+ 4 55.9	9 0 24.4	+ 5 59.1	+0.1864	0.5284	+0.2355	+51	-29
64 Ceti	5 $\frac{1}{2}$	0.26	3.7	8 3.4	15 8.5	- 3 44.2	+0.3147	0.5277	0.2261	+59	-22
ξ Ceti	4 $\frac{1}{2}$	0.25	3.6	8 19.9	15 56.7	- 2 57.5	+0.2056	0.5274	0.2252	+52	-27
ξ Arietis	5 $\frac{1}{2}$	0.19	2.8	10 6.8	21 44.8	+ 2 39.8	-0.3820	0.5270	0.2200	+20	-59
B. A. C. 755	6 $\frac{1}{2}$	0.18	2.8	10 4.2	22 42.4	+ 3 35.6	-0.1287	0.5280	0.2194	+33	-45
31 Arietis	5 $\frac{1}{2}$	+0.15	+2.3	+11 58.4	10 3 31.5	+ 8 15.8	-1.0990	0.5280	+0.2147	-23	-78
38 Arietis	5	+0.11	2.4	11 59.1	7 37.8	-11 45.6	-0.2407	0.5283	0.2103	+27	-50
Lalande 5725	6	-0.11	2.0	12 46.0	18 7.1	- 1 36.0	+1.0780	0.5304	0.1986	+90	+26
B. A. C. 1119	6	0.14	1.1	16 10.7	11 10 4.5	-10 8.8	+0.4319	0.5339	0.1774	+67	-10
B. A. C. 1206	6	0.20	1.0	16 59.9	16 38.9	- 3 47.0	+0.6833	0.5362	0.1676	+90	+ 5
B. A. C. 1240	6	-0.25	+0.6	+17 53.0	20 16.8	- 0 16.1	+0.3297	0.5370	+0.1622	+60	-14
ω Tauri	6	0.24	-0.6	19 19.0	12 0 13.8	+ 3 33.2	-0.5926	0.5378	0.1555	+ 8	-65
ω Tauri	5 $\frac{1}{2}$	0.28	+0.3	20 18.4	4 3.3	+ 7 15.3	-1.0830	0.5391	0.1491	-25	-70
NEPTUNE				19 43.6	7 7.2	+10 13.2	-0.0072	0.5391	0.1437	+40	-29
ϵ Tauri	3 $\frac{1}{2}$	0.33	0.7	18 56.2	9 25.9	-11 32.6	+1.1790	0.5405	0.1394	+90	+43
W. iv, 650	6	-0.36	+0.3	+20 27.8	13 56.2	- 7 11.1	+0.1341	0.5419	+0.1319	+48	-21
ϵ Tauri	5	0.43	0.5	21 25.9	13 1 29.0	+ 3 58.9	+0.4809	0.5463	0.1104	+72	0
105 Tauri	6	0.45	0.5	21 33.6	3 43.4	+ 6 8.8	+0.5848	0.5465	0.1060	+82	+ 7
108 Tauri	6 $\frac{1}{2}$	0.48	0.5	22 9.6	7 11.7	+ 9 30.2	+0.2841	0.5469	0.0989	+57	-10
π Tauri	5 $\frac{1}{2}$	0.50	0.5	21 59.0	8 57.6	+11 12.5	+0.6496	0.5479	0.0957	+90	+11
σ Tauri	6	-0.51	+0.6	+21 50.5	12 49.8	- 9 4.0	+1.1570	0.5482	+0.0875	+90	+46
121 Tauri	6	0.54	0.4	23 57.9	16 21.2	- 5 38.7	-0.8722	0.5494	0.0805	-11	-66
B. A. C. 1801	6	0.56	0.5	23 9.2	19 59.1	- 2 8.1	+0.2985	0.5504	0.0729	+60	- 6
132 Tauri	5 $\frac{1}{2}$	0.58	0.6	24 31.8	22 33.4	+ 0 20.9	-1.0370	0.5502	0.0674	-24	-65
1 Geminorum	5	0.58	0.9	23 16.1	14 5 29.2	+ 7 2.8	+0.7689	0.5509	0.0527	+90	+22
2 Geminorum	7	-0.59	+0.9	+23 38.8	6 42.5	+ 8 13.6	+0.4166	0.5509	+0.0490	+68	+ 3
3 Geminorum	6 $\frac{1}{2}$	0.59	0.9	23 7.8	8 3.1	+ 9 31.4	+1.0500	0.5509	0.0472	+90	+41
5 Geminorum	6 $\frac{1}{2}$	0.61	0.8	24 26.6	8 50.7	+10 17.4	-0.3596	0.5508	0.0453	+20	-39
9 Geminorum	6 $\frac{1}{2}$	0.61	1.0	23 46.7	11 20.4	-11 18.0	+0.4779	0.5517	0.0399	+73	+ 7
ϵ Geminorum	3 $\frac{1}{2}$	0.61	1.3	25 14.4	23 35.6	+ 0 31.9	-0.8085	0.5514	+0.0131	- 7	-65
MERCURY				+23 24.1	15 14 22.1	- 9 11.0	+1.1830	0.4539	-0.0139	+90	+56
NEW MOON.											
γ Cancri	4 $\frac{1}{2}$	-0.69	+3.1	21 51.9	17 7 8.5	+ 6 14.7	+0.3655	0.5391	0.1027	+63	- 6
B. A. C. 3206	6 $\frac{1}{2}$	0.50	3.5	20 15.8	18 3 20.9	+ 1 45.7	-0.2820	0.5305	0.1375	+25	-44
η Leonis	3 $\frac{1}{2}$	-0.37	+3.4	+17 17.9	19 0 48.2	- 1 23.2	-0.2815	0.5210	-0.1688	+25	-47
42 Leonis	6	0.32	3.3	15 31.8	8 15.9	+ 5 51.1	+0.3864	0.5176	0.1780	+64	-13
δ Leonis	5 $\frac{1}{2}$	0.27	3.2	14 42.0	13 38.6	+11 4.3	+0.3328	0.5160	0.1845	+60	-17
κ Leonis	5 $\frac{1}{2}$	0.22	3.2	14 46.5	21 5.5	- 5 41.9	-1.1550	0.5125	0.1925	-29	-75
ι Leonis mult.	4	0.07	2.2	11 8.1	20 17 0.9	-10 20.8	-1.1490	0.5077	0.2105	-27	-79
ω Virginis	6	-0.01	+1.8	+ 8 44.6	21 0 50.9	- 2 44.1	-0.1835	0.5062	-0.2163	+31	-49
ξ Virginis	5 $\frac{1}{2}$	+0.02	2.0	8 52.2	4 31.3	+ 0 50.1	-1.1190	0.5051	0.2183	-24	-81
ν Virginis	4	0.02	1.4	7 8.8	4 50.4	+ 1 8.7	+0.7052	0.5052	0.2185	+90	- 2
π Virginis	4 $\frac{1}{2}$	0.10	1.3	7 13.6	12 57.2	+ 9 1.8	-1.1740	0.5049	0.2231	-28	-83
ϵ Virginis	5 $\frac{1}{2}$	0.18	+0.3	3 55.5	23 30.1	- 4 43.2	+0.0619	0.5050	0.2277	+45	-36
B. A. C. 4254	6	+0.27	-0.1	+ 2 27.7	22 9 12.7	+ 4 43.0	-0.5644	0.5055	-0.2305	+11	-76
65 Virginis	6	0.51	2.1	- 4 21.0	23 9 7.0	+ 3 56.4	+1.2680	0.5113	0.2319	+86	-37
66 Virginis	6	0.52	2.3	4 35.4	9 45.2	+ 4 33.5	+1.3760	0.5111	0.2315	+85	+54
80 Virginis	6	0.59	2.3	4 50.2	15 29.6	+10 7.9	+0.3130	0.5139	0.2308	+59	-22
88 Virginis	6 $\frac{1}{2}$	0.67	2.9	6 17.4	22 5.5	- 7 27.8	+0.3530	0.5170	0.2291	+60	-24
B. A. C. 4647	6 $\frac{1}{2}$	+0.70	-3.0	- 7 31.1	24 1 30.3	- 4 9.2	+0.8843	0.5189	-0.2278	+82	+ 8
94 Virginis	6 $\frac{1}{2}$	0.76	3.4	8 22.1	7 13.9	+ 1 24.2	+0.4895	0.5217	0.2253	+68	-15
95 Virginis	6	0.71	3.6	8 47.4	7 26.7	+ 1 36.5	+0.8902	0.5219	0.2252	+81	+ 8
κ Virginis	4 $\frac{1}{2}$	0.80	3.8	9 45.8	10 31.9	+ 4 36.1	+1.2270	0.5226	0.2232	+80	+34
σ Libræ	6 $\frac{1}{2}$	1.23	4.9	15 9.1	25 19 5.3	-11 53.0	+0.0057	0.5474	0.1950	+34	-40
σ Libræ	6 $\frac{1}{2}$	+1.24	-4.5	-14 44.6	20 0.8	-10 59.4	-0.6003	0.5488	-0.1940	+ 3	-81
ζ Libræ	6	+1.28	-5.0	-16 20.0	22 21.5	- 8 43.5	+0.5993	0.5503	-0.1909	+70	- 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
γ Libræ	7	+1.29	- 5.3	-17° 3.8	25 22 56.9	- 8 9.3	+1.2440	0.5513	-0.1901	+73	+39	
γ Libræ	6	1.29	5.3	16 13.9	23 27.0	- 7 40.2	+0.2867	0.5524	0.1894	+48	-25	
γ Libræ	5½	1.29	4.9	16 28.8	26 0 27.5	- 6 41.8	+0.3523	0.5536	0.1883	+53	-21	
47 Libræ	6½	1.45	5.2	19 3.5	10 10.2	+ 2 40.6	+1.2490	0.5619	0.1748	+71	+42	
β Scorpii	2	1.51	5.1	19 30.3	14 39.9	+ 7 0.7	+0.9350	0.5652	0.1661	+70	+13	
β Scorpii	5½	+1.51	- 5.1	-19 30.1	14 40.0	+ 7 0.8	+0.9315	0.5652	-0.1661	+70	+13	
ν Scorpii	4½	1.54	4.7	19 10.6	17 28.0	+ 9 42.6	+0.1414	0.5681	0.1616	+37	-33	
ψ Ophiuchi	4½	1.62	4.5	19 46.9	22 33.1	- 9 23.5	-0.0391	0.5740	0.1521	+26	-43	
ω Ophiuchi	4½	1.67	4.6	21 13.9	27 1 51.6	- 6 12.4	+0.9455	0.5773	0.1452	+69	+15	
ω Ophiuchi var.	5	1.99	3.3	24 4.5	23 28.1	- 9 26.4	+1.1720	0.5965	0.0963	+66	+37	
ϵ Ophiuchi	5	+2.00	- 3.1	-23 52.7	28 1 25.4	- 7 33.8	+0.7896	0.5976	-0.0912	+66	+5	
63 Ophiuchi	6½	2.12	2.1	24 51.9	10 21.2	+ 0 59.9	+1.0670	0.6054	0.0666	+65	+26	
4 Sagittarii	5½	2.13	1.7	23 48.3	12 13.0	+ 2 47.1	-0.1130	0.6060	0.0617	+14	-47	
7 Sagittarii	6	2.16	0.6	24 16.8	13 21.2	+ 3 52.6	+0.2940	0.6070	0.0586	+36	-24	
P. xvii, 330	5½	2.12	1.2	23 8.4	13 40.1	+ 4 10.7	-0.8620	0.6073	0.0580	-28	-90	
9 Sagittarii	6	+2.15	- 1.5	-24 21.8	13 44.2	+ 4 14.6	+0.3522	0.6075	-0.0576	+39	-20	
B. A. C. 6161	5½	2.16	0.9	23 43.5	16 40.9	+ 7 4.2	-0.4470	0.6074	0.0492	- 4	-70	
λ Sagittarii	3	2.25	- 0.4	25 28.9	22 40.3	-11 11.9	+1.0610	0.6110	0.0314	+65	+26	
24 Sagittarii	6	2.25	0.0	24 6.8	20 52.7	- 9 5.2	-0.3547	0.6128	0.0249	- 3	-63	
25 Sagittarii	6½	2.25	0.0	24 18.3	1 7.0	- 8 51.4	-0.1716	0.6130	0.0244	+ 8	-51	
B. A. C. 6343	6½	+2.23	+ 0.4	-23 35.9	2 35.1	- 7 27.1	-0.9010	0.6131	-0.0197	-33	-90	
26 Sagittarii	6½	2.27	0.6	23 56.1	3 48.2	- 6 17.2	-0.5913	0.6139	0.0160	-16	-84	
B. A. C. 6369	6	2.30	0.5	25 7.2	4 52.3	- 5 15.8	+0.5649	0.6148	-0.0128	+50	- 8	
ψ Sagittarii	5½	2.38	2.2	25 26.7	16 3.3	+ 5 26.3	+0.9311	0.6169	+0.0214	+65	+16	
χ Sagittarii	5½	2.38	2.9	24 43.3	19 36.0	+ 8 49.8	+0.3143	0.6167	0.0330	+35	-22	
χ Sagittarii	6½	+2.38	+ 2.9	-24 37.6	19 38.4	+ 8 52.1	+0.2226	0.6167	+0.0330	+29	-27	
χ Sagittarii	5½	2.38	3.0	24 10.7	19 41.5	+ 8 55.1	-0.2160	0.6167	0.0330	+ 6	-54	
λ Sagittarii	6	2.41	3.5	24 57.6	23 30.0	-11 26.2	+0.6988	0.6176	0.0453	+64	0	
λ Sagittarii	4½	2.41	3.5	25 7.5	23 44.4	-11 12.5	+0.8708	0.6176	0.0456	+65	+11	
53 Sagittarii	6½	2.40	3.8	23 40.6	30 0 53.9	-10 6.0	-0.4952	0.6167	0.0486	- 8	-74	
B. A. C. 6727	6	+2.40	+ 3.8	-23 40.8	1 0.3	- 9 59.9	-0.4870	0.6167	+0.0486	- 8	-73	
4 Capricorni	6	2.40	4.9	22 8.8	14 50.3	+ 3 14.3	-1.0150	0.6148	0.0907	-35	-90	
17 Capricorni	6	2.40	7.6	21 54.7	31 1 13.5	-10 49.0	-0.1499	0.6110	0.1166	+16	-49	
η Capricorni	5	2.36	8.6	20 17.3	8 4.3	- 4 15.4	-0.8519	0.6067	0.1375	-20	-90	
χ Capricorni	5½	2.36	8.8	21 38.0	9 37.1	- 2 46.5	+0.6792	0.6060	0.1426	+67	-2	
27 Capricorni	6½	+2.34	+ 8.9	-20 59.7	9 59.7	- 2 24.9	+0.1108	0.6053	+0.1427	+33	-34	
ϕ Capricorni	5½	2.35	9.2	21 6.4	12 18.1	- 0 12.2	+0.5554	0.6043	0.1479	+60	-10	
ϵ Capricorni	4½	2.29	10.2	19 57.3	20 32.1	+ 7 41.6	+0.7313	0.5980	0.1678	+70	0	
κ Capricorni	5	+2.26	+10.4	-19 21.8	22 41.9	+ 9 46.2	+0.5229	0.5965	+0.1722	+60	-12	

AUGUST.

29 Aquarii	mult	6½	+2.22	+11.1	-17 29.4	1 6 29.1	-6 45.2	+0.0948	0.5912	+0.1886	+37	-35
56 Aquarii		6½	2.10	11.9	15 8.6	17 42.9	+4 2.4	+0.0164	0.5821	0.2075	+35	-39
γ Aquarii	mult.	5½	2.05	12.5	14 37.9	2 0 54.2	+10 57.4	+1.0450	0.5762	0.2179	+75	+20
γ Aquarii		4	+2.04	+12.5	-14 10.2	1 41.6	+11 43.0	+0.7634	0.5755	+0.2191	+72	+1
74 Aquarii		6	2.02	12.3	12 11.9	3 19.6	-10 42.6	-0.8194	0.5738	0.2206	-9	-90
ψ Aquarii		4	1.92	12.4	9 41.0	14 49.4	-1 33.6	-1.1600	0.5672	0.2316	-31	-90
ψ Aquarii		4	1.91	12.5	9 46.8	13 42.4	-0 42.6	-0.8547	0.5661	0.2324	-9	-90
ψ Aquarii		4½	1.90	12.5	10 12.5	14 9.6	-0 16.2	-0.3283	0.5659	0.2327	+20	-60
B. A. C. 8274		7	+1.78	+12.5	-6 59.3	3 3 6.7	-11 46.9	-0.3804	0.5571	+0.2424	+19	-63
30 Piscium		4½	1.71	12.7	6 37.4	9 6.6	-5 59.3	+0.6516	0.5534	0.2452	+81	-6
33 Piscium		4½	1.70	12.6	6 19.2	10 38.1	-4 30.9	+0.7228	0.5530	0.2461	+84	-2
B. A. C. 17		6	1.68	12.5	5 51.3	12 53.0	-2 20.7	+0.8122	0.5518	0.2468	+84	+3
14 Ceti		6	1.57	11.6	1 6.4	4 0 26.2	+8 49.2	-1.1040	0.5452	0.2487	-23	-90
15 Ceti		6½	+1.55	+11.5	-1 6.4	1 37.2	+9 57.7	-0.8097	0.5441	+0.2485	-4	-90
26 Ceti		6	+1.43	+11.1	+0 46.8	12 38.9	-2 24.2	+0.2580	0.5398	+0.2471	+55	-26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$	$d^{\circ} h^m$	h^m					
29 Ceti	6 $\frac{1}{2}$	+1.40	+10.8	+ 1 25.3	4 15 36.9	- 0 30.0	+0.0884	0.5390	+0.2464	+45 -35
33 Ceti	6	1.39	10.6	1 51.9	16 50.1	+ 0 40.8	-0.0629	0.5382	0.2459	+37 -44
35 Ceti	6 $\frac{1}{2}$	1.38	10.7	1 53.6	17 46.1	+ 1 35.0	+0.1379	0.5387	0.2458	+48 -33
f Piscium	5	1.35	10.3	3 2.3	20 15.7	+ 3 59.8	-0.4232	0.5379	0.2451	+18 -66
v Piscium	4 $\frac{1}{2}$	1.26	10.0	4 56.0	5 7 31.8	- 9 5.9	+0.3591	0.5352	0.2388	+61 -21
64 Ceti	5 $\frac{1}{2}$	+1.11	+ 8.6	+ 8 3.4	21 53.9	+ 4 48.8	+0.4896	0.5333	+0.2285	+71 -13
ξ Ceti	4 $\frac{1}{2}$	1.10	8.5	8 19.9	22 40.9	+ 5 34.2	+0.3919	0.5331	0.2276	+63 -18
ξ Arietis	5 $\frac{1}{2}$	1.05	7.7	10 6.8	4 21.5	+11 4.1	-0.1986	0.5328	0.2225	+30 -49
B. A. C. 755	6 $\frac{1}{2}$	1.05	7.7	10 4.2	5 17.7	+11 58.4	+0.0597	0.5325	0.2216	+45 -34
31 Arietis	5 $\frac{1}{2}$	1.01	6.9	11 58.4	10 0.8	- 7 27.4	-0.9055	0.5325	0.2166	-10 -78
38 Arietis	5	+0.96	+ 6.9	+11 59.1	14 2.3	- 3 33.6	-0.0579	0.5334	+0.2123	+37 -39
Lalande 5725	6	0.87	6.4	12 46.1	7 0 20.9	+ 6 25.2	+1.2435	0.5337	0.1999	+90 +41
B. A. C. 1119	6	0.71	4.8	16 10.8	16 5.4	- 2 20.5	+0.5979	0.5358	0.1778	+81 -2
B. A. C. 1206	6	0.63	4.5	17 0.0	22 35.6	+ 3 57.1	+0.8447	0.5370	0.1672	+90 +14
B. A. C. 1240	6	0.63	4.0	17 53.1	8 2 11.8	+ 7 26.3	+0.4884	0.5378	0.1617	+72 -6
ω Tauri	6	+0.60	+ 3.4	+19 19.1	6 6.7	+11 13.5	-0.4309	0.5395	+0.1555	+17 -55
ω Tauri	5 $\frac{1}{2}$	0.55	3.1	20 18.5	9 54.6	- 9 5.8	-0.9226	0.5400	0.1489	-13 -70
NEPTUNE				19 49.9	14 11.6	- 4 57.3	+0.2072	0.5402	0.1413	+53 -18
W. iv, 650	6	0.44	2.8	20 27.9	19 44.3	+ 0 24.4	+0.2634	0.5418	0.1308	+57 -12
ι Tauri	5	0.45	2.5	21 26.0	9 7 15.1	+11 32.4	+0.6170	0.5449	0.1096	+86 +8
105 Tauri	6	+0.32	+ 2.3	+21 33.7	9 29.2	-10 18.0	+0.7150	0.5449	+0.1046	+90 +14
108 Tauri	6 $\frac{1}{2}$	0.29	2.1	22 9.6	12 57.3	- 6 57.6	+0.4164	0.5459	0.0980	+67 -3
α Tauri	5 $\frac{1}{2}$	0.27	2.1	21 59.0	14 43.0	- 5 14.9	+0.7796	0.5468	0.0942	+90 +19
121 Tauri	6	0.20	1.4	23 57.9	22 6.7	+ 1 54.2	-0.7464	0.5475	0.0794	-3 -66
B. A. C. 1801	6	0.20	1.8	23 9.2	10 1 44.6	+ 5 24.8	+0.4151	0.5483	0.0714	+68 +1
132 Tauri	5 $\frac{1}{2}$	+0.18	+ 1.8	+24 31.8	4 19.2	+ 7 54.1	-0.9160	0.5479	+0.0665	-14 -65
1 Geminorum	5	0.11	1.6	23 16.1	11 15.7	- 9 23.3	+0.8756	0.5485	0.0516	+90 +29
2 Geminorum	7	0.10	1.5	23 38.8	12 29.1	- 8 12.4	+0.5193	0.5493	0.0482	+76 +9
3 Geminorum	6 $\frac{1}{2}$	0.09	1.6	23 7.8	13 49.9	- 6 54.4	+1.1540	0.5493	0.0456	+90 +50
5 Geminorum	6 $\frac{1}{2}$	0.06	1.3	24 26.6	14 37.6	- 6 8.3	-0.2569	0.5491	0.0438	+26 -33
9 Geminorum	6 $\frac{1}{2}$	+0.06	+ 1.4	+23 46.7	17 7.8	- 3 43.2	+0.5781	0.5490	+0.0387	+82 +12
z Geminorum	3 $\frac{1}{2}$	-0.02	1.2	25 14.4	11 5 25.3	+ 8 9.1	-0.7237	0.5491	0.0112	-2 -65
37 Geminorum	6 $\frac{1}{2}$	0.06	1.1	25 30.7	10 37.5	-10 48.8	-0.9926	0.5488	+0.0002	-21 -64
α Geminorum	5 $\frac{1}{2}$	0.08	1.3	24 22.2	13 54.2	- 7 38.8	+0.2583	0.5490	-0.0068	+56 -2
48 Geminorum	6	0.10	1.3	24 18.8	18 30.7	- 3 11.6	+0.2675	0.5484	0.0171	+57 -2
52 Geminorum	6 $\frac{1}{2}$	-0.12	+ 1.2	+25 4.5	19 31.7	- 2 12.6	-0.5960	0.5482	-0.0194	+6 -53
A Geminorum	5 $\frac{1}{2}$	0.16	1.2	25 15.6	23 34.5	+ 1 42.0	-0.8966	0.5480	0.0281	-13 -65
κ Geminor. mult	3 $\frac{1}{2}$	0.18	1.4	24 39.7	19 9 17.7	+11 5.8	-0.6045	0.5457	0.0478	+6 -57
82 Geminorum	6 $\frac{1}{2}$	0.20	1.5	23 24.7	11 14.0	-11 1.8	+0.6871	0.5459	0.0522	+90 +17
μ Cancri	6 $\frac{1}{2}$	0.20	1.9	22 57.0	19 32.4	- 2 59.8	+0.6908	0.5435	0.0701	+90 +16
γ Cancri	4 $\frac{1}{2}$	-0.28	+ 2.0	+21 51.9	13 13 7.0	- 9 69.4	+0.3674	0.5384	-0.1039	+64 -6
NEW MOON.										
ι Leonis mult.	4	0.16	2.4	11 8.1	16 22 55.6	- 2 38.6	-1.2930	0.5090	0.2128	-41 -79
ω Virginis	6	0.13	2.0	8 44.6	17 6 45.1	+ 4 57.5	-0.3364	0.5076	0.2102	+23 -58
ξ Virginis	5 $\frac{1}{2}$	-0.11	+ 2.1	+ 8 52.2	10 25.7	+ 8 31.9	-1.2830	0.5063	-0.2204	-39 -81
v Virginis	4	0.11	1.8	7 8.8	10 44.7	+ 8 50.4	+0.5450	0.5064	0.2206	+75 -11
π Virginis	4 $\frac{1}{2}$	0.06	1.7	7 13.6	18 51.5	- 7 16.5	-1.3460	0.5058	0.2248	-49 -83
c Virginis	5 $\frac{1}{2}$	-0.02	1.1	3 55.5	5 25.6	+ 2 59.7	-0.1244	0.5056	0.2204	+34 -46
B. A. C. 4254	6	+0.05	+ 0.9	+ 2 27.7	15 10.2	-11 32.1	-0.7669	0.5052	0.2115	0 -78
65 Virginis	6	+0.22	- 0.2	- 4 20.9	19 15 14.4	+11 51.3	+1.0470	0.5091	-0.2318	+86 +18
80 Virginis	6	0.28	1.4	4 50.1	21 47.1	- 5 53.2	+0.0829	0.5118	0.2306	+44 -36
88 Virginis	6 $\frac{1}{2}$	0.33	1.5	6 17.4	20 4 21.8	+ 0 35.9	+0.1203	0.5138	0.2284	+46 -34
B. A. C. 4647	6 $\frac{1}{2}$	0.36	1.9	7 31.1	7 49.4	+ 3 57.4	+0.6540	0.5150	0.2269	+81 -6
94 Virginis	6 $\frac{1}{2}$	0.39	2.1	8 22.1	13 38.2	+ 9 35.9	+0.2540	0.5177	0.2242	+53 -27
95 Virginis	6	+0.39	- 2.3	- 8 47.4	13 51.3	+ 9 48.6	+0.6572	0.5170	-0.2238	+80 -6
κ Virginis	4 $\frac{1}{2}$	+0.46	- 2.5	- 9 45.8	16 59.4	-11 8.9	+1.0000	0.5194	-0.2223	+80 +15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
α^1 Libræ	6½	+0.86	- 3.9	-15° 9.1	22 2 14.3	- 2 56.4	-0.2352	0.5407	-0.1927	+22	-55	
α^2 Libræ	6½	0.85	3.5	14 44.6	3 11.1	- 2 1.5	-0.8492	0.5420	0.1916	-12	-90	
ζ^1 Libræ	6	0.89	4.1	16 20.0	5 35.5	+ 0 18.1	+0.3678	0.5435	0.1881	+53	-21	
ζ^2 Libræ	7	0.90	4.5	17 3.8	6 11.8	+ 0 53.2	+1.0190	0.5434	0.1865	+73	+18	
ζ^3 Libræ	6	0.99	4.5	16 13.9	6 42.7	+ 1 23.1	+0.0542	0.5439	0.1865	+36	-38	
ζ^4 Libræ	5½	+0.93	- 4.0	-16 28.8	7 44.8	+ 2 23.2	+0.1206	0.5448	-0.1854	+40	-34	
47 Libræ	6½	1.07	4.7	19 3.5	17 43.8	-11 58.1	+1.0350	0.5531	0.1707	+71	+20	
β^1 Scorpii	2	1.14	4.6	19 30.3	22 21.4	- 7 30.1	+0.7226	0.5568	0.1636	+70	0	
β^2 Scorpii	5½	1.14	4.6	19 30.1	22 21.4	- 7 30.1	+0.7191	0.5568	0.1636	+70	0	
γ^2 Scorpii	4½	1.17	4.3	19 10.6	23 1 14.5	- 4 43.2	-0.0830	0.5593	0.1589	+25	-45	
ψ Ophiuchi	4½	+1.25	- 4.2	-19 46.9	6 28.9	+ 0 20.0	-0.2603	0.5637	-0.1485	+15	-56	
ω Ophiuchi	4½	1.31	4.4	21 13.9	9 53.4	+ 3 37.2	+0.7418	0.5668	0.1426	+68	+ 1	
b Ophiuchi	5	1.68	3.8	24 4.5	24 8 11.3	+ 1 4.6	+0.9982	0.5857	0.0937	+66	+20	
c^2 Ophiuchi	5	1.70	3.6	23 52.7	10 12.3	+ 3 1.0	+0.6146	0.5882	0.0890	+59	- 6	
63 Ophiuchi	6½	1.85	2.8	24 51.9	19 25.3	+11 52.1	+0.9038	0.5939	0.0640	+65	+13	
4 Sagittarii	5½	+1.87	- 2.4	-23 48.3	21 20.5	-10 17.4	-0.2867	0.5957	-0.0599	+ 5	-58	
7 Sagittarii	6	1.89	2.3	24 16.8	22 31.0	- 9 9.7	+0.1263	0.5956	0.0557	+26	-33	
P. xvii, 330	5½	1.88	1.9	23 8.4	22 50.5	- 8 51.0	-1.0435	0.5961	0.0555	-40	-90	
9 Sagittarii	6	1.92	2.3	24 21.8	22 54.7	- 8 47.0	+0.1868	0.5961	0.0555	+29	-30	
B. A. C. 6161	5½	1.91	1.7	23 43.5	25 1 56.8	- 5 52.2	-0.6134	0.5980	0.0470	-14	-88	
λ Sagittarii	3	+2.04	- 1.5	-25 28.9	8 7.3	+ 0 3.1	+0.9212	0.6018	-0.0298	+65	+15	
24 Sagittarii	6	2.06	0.8	24 6.8	10 23.6	+ 2 13.7	-0.5134	0.6029	0.0222	-11	-76	
25 Sagittarii	6½	2.06	0.9	24 18.3	10 38.3	+ 2 27.9	-0.3260	0.6029	0.0219	- 2	-61	
B. A. C. 6343	6½	2.06	0.4	23 35.9	12 9.0	+ 3 54.8	-1.0650	0.6038	0.0182	-45	-90	
26 Sagittarii	6½	2.08	- 0.3	23 56.1	13 24.3	+ 5 6.9	-0.7462	0.6034	-0.0135	-25	-90	
ψ Sagittarii	5½	+2.25	+ 0.9	-25 26.7	26 1 59.7	- 6 49.2	+0.8158	0.6081	+0.0199	+65	+ 7	
χ^1 Sagittarii	5½	2.28	1.7	24 43.3	5 37.9	- 3 20.1	+0.1986	0.6084	0.0343	+29	-29	
χ^2 Sagittarii	6½	2.28	1.7	24 37.6	5 40.4	- 3 17.7	+0.1059	0.6084	0.0343	+23	-34	
χ^3 Sagittarii	5½	2.27	1.9	24 10.7	5 43.7	- 3 14.5	-0.3378	0.6084	0.0344	0	-62	
λ^1 Sagittarii	6	2.33	2.2	24 57.6	9 37.7	+ 0 29.6	+0.5933	0.6089	0.0462	+55	- 7	
λ^2 Sagittarii	4½	+2.33	+ 2.2	-25 7.5	9 52.5	+ 0 43.9	+0.7684	0.6088	+0.0466	+65	+ 5	
53 Sagittarii	6½	2.32	2.8	23 40.6	11 3.7	+ 1 51.9	-0.6081	0.6092	0.0499	-14	-86	
B. A. C. 6727	6	2.32	2.8	23 40.8	11 10.2	+ 1 58.1	-0.5999	0.6092	0.0499	-13	-85	
17 Capricorni	6	2.49	6.9	21 54.7	27 11 51.4	+ 1 37.1	-0.2049	0.6059	0.1213	+14	-53	
η Capricorni	5	2.49	8.1	20 17.3	18 47.5	+ 8 16.0	-0.8952	0.6027	0.1394	-22	-90	
χ Capricorni	5½	+2.51	+ 8.2	-21 38.0	20 21.2	+ 9 45.8	+0.6480	0.6031	+0.1428	+66	- 4	
27 Capricorni	6½	2.50	8.5	20 59.7	20 44.1	+10 7.7	+0.0720	0.6023	0.1445	+31	-36	
ϕ Capricorni	5½	2.51	8.6	21 6.4	23 3.9	-11 38.2	+0.5246	0.5999	0.1497	+58	-12	
33 Capricorni	5½	2.53	9.0	21 19.1	24 20.6	- 8 29.4	+1.2390	0.5990	0.1574	+69	+42	
37 Capricorni	6	2.52	9.7	20 34.3	6 29.4	- 4 30.8	+1.1810	0.5969	0.1680	+69	+34	
ϵ Capricorni	4½	+2.52	+ 9.9	-19 57.3	7 21.6	- 3 40.6	+0.7223	0.5967	+0.1689	+70	0	
κ Capricorni	5	2.52	10.2	19 21.8	9 32.1	- 1 35.4	+0.5163	0.5957	0.1747	+60	-12	
B. A. C. 7550	6½	2.52	10.2	20 7.2	9 45.2	- 1 22.8	+1.2660	0.5953	0.1749	+70	+51	
29 Aquarii	mult.	6½	2.49	11.4	17 29.4	+ 5 54.7	+0.1062	0.5909	0.1901	+37	-35	
56 Aquarii	6½	2.45	12.8	15 8.6	29 4 33.6	- 7 18.6	+0.0572	0.5829	0.2107	+37	-37	
τ^1 Aquarii	mult.	5½	+2.43	+13.6	-14 37.9	11 41.7	- 0 26.9	+1.0990	0.5790	+0.2214	+75	+23
τ^2 Aquarii	4	2.42	13.6	14 10.2	12 29.6	+ 0 19.3	+0.8200	0.5780	0.2226	+76	+ 4	
74 Aquarii	6	2.40	13.7	12 11.9	14 6.8	+ 1 52.8	-0.7539	0.5771	0.2244	- 5	-90	
ψ^1 Aquarii	4	2.35	15.2	9 41.0	23 30.8	+10 56.0	-1.0610	0.5706	0.2356	-22	-90	
ψ^2 Aquarii	4	2.34	15.2	9 46.8	30 0 23.2	+11 46.4	-0.7590	0.5703	0.2361	- 3	-90	
ψ^3 Aquarii	4½	+2.38	+15.0	-10 12.5	0 50.0	-11 47.7	-0.2311	0.5698	+0.2368	+25	-54	
B. A. C. 8274	7	2.29	14.9	6 59.3	13 35.2	+ 0 29.9	-0.3201	0.5635	0.2475	+22	-59	
30 Piscium	4½	2.25	15.0	6 37.4	19 28.2	+ 6 10.5	+0.7832	0.5598	0.2505	+74	+ 1	
33 Piscium	5	2.24	14.9	6 19.2	20 57.9	+ 7 37.0	+0.8576	0.5589	0.2508	+84	+ 6	
B. A. C. 17	6	2.23	14.9	5 51.3	23 10.0	+ 9 44.5	+0.9504	0.5585	0.2518	+84	+12	
14 Ceti	6	+2.15	+14.9	- 1 6.4	31 10 27.3	- 3 21.6	-0.9183	0.5522	+0.2539	-10	-90	
15 Ceti	6½	+2.15	+14.9	- 1 6.3	11 36.4	- 2 14.9	-0.6288	0.5514	+0.2537	+ 8	-82	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
26 Ceti	6	+2.07	+14.7	+ 0° 46.9	31 23 19.5	+ 9 4.4	+0.4505	0.5474	+0.2522	+68°	-17°

SEPTEMBER.

29 Ceti	6½	+2.07	+14.6	+ 1 25.4	1 1 14.4	+10 55.6	+0.2886	0.5470	+0.2519	+57	-25
33 Ceti	6	+2.06	+14.4	+ 1 52.0	2 25.5	-11 55.8	+0.1376	0.5462	+0.2512	+48	-33
35 Ceti	6½	2.03	14.6	1 53.7	3 20.0	-11 3.1	+0.3378	0.5466	0.2513	+60	-23
♏ Piscium	5	2.03	14.2	3 2.4	5 45.4	- 8 42.5	-0.2087	0.5460	0.2515	+30	-52
♏ Piscium	4½	1.95	13.9	4 56.0	16 42.0	+ 1 52.3	+0.5813	0.5438	0.2441	+78	- 9
64 Ceti	5½	1.87	12.7	8 3.5	2 6 38.5	- 8 38.7	+0.7259	0.5419	0.2330	+90	0
ξ Ceti	4½	+1.85	+12.6	+ 8 20.0	7 24.1	- 7 54.7	+0.6198	0.5416	+0.2322	+82	- 6
ξ Arietis	5½	1.82	11.8	10 6.9	12 54.7	- 2 34.9	+0.0550	0.5412	0.2268	+44	-36
B. A. C. 755	6½	1.81	11.8	10 4.3	13 49.1	- 1 42.3	+0.3024	0.5408	0.2256	+58	-22
31 Arietis	5½	1.78	11.0	11 58.5	18 24.1	+ 2 43.7	-0.6408	0.5418	0.2208	+ 6	-76
38 Arietis	5	1.74	10.9	11 59.2	22 18.4	+ 6 30.3	+0.2006	0.5413	0.2174	+52	-26
B. A. C. 1119	6	+1.54	+ 9.3	+16 10.8	3 23 38.5	+ 7 0.2	+0.8574	0.5430	+0.1800	+90	+14
B. A. C. 1206	6	1.50	7.8	17 0.0	4 5 59.2	-10 51.6	+1.1040	0.5437	0.1696	+90	+33
B. A. C. 1240	6	1.48	7.1	17 53.1	9 30.4	- 7 27.5	+0.7521	0.5440	0.1630	+90	+10
♉ Tauri	6	1.45	6.5	19 19.1	13 19.9	- 3 45.6	-0.1596	0.5443	0.1569	+32	-40
♉ Tauri	5½	1.41	6.0	20 18.5	17 2.9	- 0 10.0	-0.6442	0.5452	0.1502	+ 5	-67
NEPTUNE				+19 51.3	21 45.0	+ 4 22.5	+0.5223	0.5455	+0.1412	+75	- 2
B. A. C. 1373	6	+1.36	+ 5.4	21 22.5	21 57.4	+ 4 34.6	-1.0750	0.5453	0.1408	-25	-60
W. iv, 650	6	1.33	5.3	20 27.9	5 2 40.7	+ 9 8.3	+0.5439	0.5465	0.1316	+78	+ 2
♈ Tauri	5	1.20	4.5	21 26.0	13 59.5	- 3 55.7	+0.8704	0.5475	0.1093	+90	+23
105 Tauri	6	1.18	4.2	21 33.7	16 11.3	- 1 48.3	+0.9674	0.5482	0.1046	+90	+29
108 Tauri	6½	+1.15	+ 3.8	+22 9.7	19 36.4	+ 1 29.8	+0.6661	0.5489	+0.0976	+90	+12
♊ Tauri	5½	1.12	3.6	21 59.1	21 20.6	+ 3 10.4	+1.0230	0.5484	0.0940	+90	+34
121 Tauri	6	1.09	2.9	23 57.9	6 4 38.5	+10 13.5	-0.4945	0.5493	0.0785	+13	-51
B. A. C. 1801	6	1.03	2.8	23 9.2	8 14.0	-10 18.3	+0.6589	0.5494	0.0711	+90	+14
132 Tauri	5½	1.02	2.6	24 31.8	10 46.7	- 7 50.9	-0.6691	0.5499	0.0654	+ 2	-62
1 Geminorum	5	+0.92	+ 2.3	+23 16.1	17 39.2	- 1 12.3	+1.1060	0.5495	+0.0503	+90	+45
2 Geminorum	7	0.91	2.1	23 38.8	18 51.9	- 0 2.1	+0.7537	0.5500	0.0476	+90	+22
5 Geminorum	6½	0.96	1.8	24 26.6	20 59.3	+ 2 0.9	-0.0220	0.5498	0.0431	+39	-20
9 Geminorum	6½	0.86	1.9	23 46.7	23 28.3	+ 4 24.8	+0.8066	0.5499	0.0374	+90	+25
ε Geminorum	3½	0.76	1.0	25 14.4	7 11 40.9	- 7 47.5	-0.5047	0.5493	+0.0105	+14	-52
37 Geminorum	6½	+0.70	+ 0.9	+25 30.7	16 51.8	- 2 47.1	-0.7812	0.5490	-0.0009	- 5	-64
♊ Geminorum	5½	0.64	0.8	24 22.2	20 7.8	+ 0 22.3	+0.4633	0.5481	0.0081	+72	+10
48 Geminorum	6	0.65	0.6	24 18.8	8 0 43.2	+ 4 48.4	+0.4642	0.5479	0.0182	+72	+ 9
52 Geminorum	6½	0.63	0.3	25 4.5	1 44.1	+ 5 47.2	-0.3960	0.5478	0.0205	+18	-39
A Geminorum	5½	0.58	+ 0.1	25 15.6	5 46.5	+ 9 41.5	-0.6998	0.5465	0.0292	0	-63
κ Geminor. mult.	4	+0.48	0.0	+24 39.7	15 28.8	- 4 55.6	-0.4244	0.5441	-0.0501	+17	-44
82 Geminorum	6½	0.45	+ 0.4	23 24.7	17 24.9	- 3 3.4	+0.8598	0.5434	0.0541	+90	+27
μ Cancri	6½	0.40	+ 0.3	22 57.0	9 1 43.2	+ 4 58.5	+0.8523	0.5420	0.0713	+90	+25
λ Cancri	5½	0.34	- 0.2	24 22.1	8 24.2	+11 26.4	-1.2430	0.5398	0.0845	-47	-66
γ Cancri	4½	0.34	+ 0.1	21 51.9	19 18.2	- 2 0.7	+0.4982	0.5368	0.1056	+74	+ 2
B. A. C. 3138	6½	+0.16	0.0	+31 44.2	10 10 1.1	-11 45.8	-1.1080	0.5311	-0.1319	-28	-68
B. A. C. 3206	6½	0.11	+ 0.2	20 15.8	15 32.1	- 6 25.2	-0.2241	0.5292	0.1409	+28	-41
η Leonis	3½	+0.02	+ 0.4	+17 17.9	11 12 57.2	- 9 39.3	-0.3032	0.5212	0.1731	+24	-49

NEW MOON.

65 Virginia	6	+0.02	- 0.4	- 4 20.9	15 20 56.5	- 4 39.2	+0.8572	0.5117	-0.2350	+86	+ 5
66 Virginia	6	0.03	0.5	4 35.3	21 35.0	- 4 1.8	+0.9674	0.5118	0.2348	+86	+12
♍ Virginia	5	0.04	0.6	5 41.3	16 1 29.4	- 0 14.2	+1.2400	0.5130	0.2338	+84	+34
80 Virginia	6	0.05	0.6	4 50.1	3 21.5	+ 1 34.6	-0.1205	0.5128	0.2330	+33	-47
88 Virginia	6½	0.08	0.9	6 17.3	10 0.5	+ 8 2.0	-0.0969	0.5153	0.2310	+34	-46
B. A. C. 4647	6½	+0.10	- 1.1	- 7 31.0	13 27.4	+11 22.8	+0.4327	0.5172	-0.2292	+65	-18
94 Virginia	6½	+0.14	- 1.3	- 8 22.0	19 15.4	- 6 59.6	+0.0233	0.5184	-0.2263	+40	-39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	α'	γ'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$		d h m	h m							
95 Virginis	6	+0.13	-1.4	-8 47.3	16 19 28.3	-6 47.0	+0.4293	0.5187	-0.2261	+64	-18		
κ Virginis	4 $\frac{1}{2}$	0.17	1.6	9 45.7	22 36.1	-3 44.8	+0.7674	0.5207	0.2245	+76	0		
2 Libræ	6 $\frac{1}{2}$	0.19	1.9	11 12.7	17 3 54.6	+1 24.1	+1.1360	0.5225	0.2207	+79	+25		
μ Libræ	5 $\frac{1}{2}$	0.31	2.8	13 41.4	16 43.5	-10 10.7	+1.0140	0.5299	0.2102	+76	+17		
σ Libræ	6 $\frac{1}{2}$	0.45	3.0	15 9.1	18 7 56.0	+4 32.7	-0.5025	0.5393	0.1930	+8	-73		
σ Libræ	6 $\frac{1}{2}$	+0.46	-2.7	-14 44.6	8 53.2	+5 28.0	-1.1190	0.5402	-0.1917	-31	-90		
ζ^1 Libræ	6	0.49	3.2	16 20.0	11 18.6	+7 48.6	+0.1021	0.5412	0.1886	+39	-35		
ζ^2 Libræ	7	0.49	3.5	17 3.8	11 55.3	+8 24.1	+0.7588	0.5420	0.1877	+70	+1		
ζ^3 Libræ	6	0.50	3.6	16 13.9	12 26.4	+8 54.2	-0.2218	0.5425	0.1870	+22	-54		
ζ^4 Libræ	5 $\frac{1}{2}$	0.51	4.1	16 28.8	13 28.9	+9 54.7	-0.1320	0.5435	0.1858	+26	-49		
47 Libræ	6 $\frac{1}{2}$	+0.62	-3.9	-19 3.5	23 34.1	-4 20.4	+0.7652	0.5499	-0.1708	+71	+2		
β^1 Scorpii	2	0.69	3.8	19 30.3	19 4 15.1	+0 11.0	+0.4544	0.5534	0.1628	+56	-16		
β^2 Scorpii	5 $\frac{1}{2}$	0.69	3.8	19 30.1	4 15.2	+0 11.0	+0.4510	0.5534	0.1628	+56	-16		
ν^2 Scorpii	4 $\frac{1}{2}$	0.73	3.8	19 10.6	7 10.7	+3 0.5	-0.3595	0.5567	0.1578	+11	-63		
ψ Ophiuchi	4 $\frac{1}{2}$	0.80	3.6	19 46.9	12 29.9	+8 8.5	-0.5383	0.5599	0.1483	+1	-77		
ω Ophiuchi	4 $\frac{1}{2}$	+0.86	-3.9	-21 13.9	15 57.7	+11 28.9	+0.4730	0.5619	-0.1416	+55	-15		
39 Ophiuchi	5 $\frac{1}{2}$	1.11	4.1	24 10.0	20 11 17.5	+6 6.2	+1.1680	0.5764	0.1000	+66	+36		
B. A. C. 5831	6 $\frac{1}{2}$	1.15	4.0	23 57.2	11 19.9	+6 8.5	+0.9448	0.5764	0.1000	+66	+15		
b Ophiuchi <i>var.</i>	5	1.20	4.0	24 4.5	14 43.5	+9 24.4	+0.7435	0.5786	0.0919	+66	+2		
c^2 Ophiuchi	5	1.23	3.7	23 52.7	16 47.4	+11 23.6	+0.3522	0.5797	0.0870	+41	-21		
63 Ophiuchi	6 $\frac{1}{2}$	+1.38	-3.3	-24 52.0	21 2 15.0	-3 30.6	+0.6580	0.5844	-0.0632	+61	-3		
4 Sagittarii	5 $\frac{1}{2}$	1.40	2.8	23 48.4	4 13.5	-1 36.8	-0.5503	0.5861	0.0582	-10	-80		
7 Sagittarii	6	1.42	2.7	24 16.8	5 25.9	-0 27.2	-0.1316	0.5872	0.0548	+12	-49		
9 Sagittarii	6	1.43	2.8	24 21.8	5 50.2	-0 3.8	-0.0684	0.5875	0.0540	+16	-45		
B. A. C. 6161	5 $\frac{1}{2}$	1.47	2.2	23 43.5	8 57.6	+2 56.2	-0.8788	0.5888	0.0455	-29	-90		
λ Sagittarii	3	+1.60	-2.3	-25 28.9	15 19.2	+9 2.6	+0.6836	0.5913	-0.0281	+61	-1		
24 Sagittarii	6	1.62	1.6	24 6.8	17 39.6	+11 17.4	-0.7707	0.5920	0.0216	-25	-90		
25 Sagittarii	6 $\frac{1}{2}$	1.62	1.7	24 18.3	17 54.7	+11 31.9	-0.5807	0.5921	0.0210	-15	-83		
26 Sagittarii	6 $\frac{1}{2}$	1.66	1.1	23 56.1	20 45.9	-9 43.8	-1.0035	0.5929	0.0127	-41	-90		
B. A. C. 6369	6	1.69	1.5	25 7.2	21 53.9	-8 38.5	+0.1899	0.5936	-0.0098	+25	-30		
ψ Sagittarii	5 $\frac{1}{2}$	+1.84	-0.3	-25 26.7	22 9 45.8	+2 44.6	+0.6003	0.5969	+0.0239	+54	-6		
χ^1 Sagittarii	5 $\frac{1}{2}$	1.88	+0.4	24 43.3	13 31.4	+6 21.1	-0.0219	0.5971	0.0347	+16	-42		
χ^2 Sagittarii	6 $\frac{1}{2}$	1.88	0.4	24 37.6	13 33.9	+6 23.5	-0.1161	0.5971	0.0347	+11	-48		
χ^3 Sagittarii	5 $\frac{1}{2}$	1.88	0.6	24 10.7	13 37.3	+6 26.8	-0.5672	0.5971	0.0350	-12	-81		
λ^1 Sagittarii	6	1.95	0.8	24 57.6	17 39.3	+10 18.9	+0.3849	0.5977	0.0465	+40	-19		
λ^2 Sagittarii	4 $\frac{1}{2}$	+1.96	+0.8	-25 7.5	17 54.7	+10 33.7	+0.5646	0.5977	+0.0470	+54	-9		
53 Sagittarii	6 $\frac{1}{2}$	1.92	1.4	23 40.6	19 8.2	+11 44.2	-0.8369	0.5981	0.0505	-26	-90		
B. A. C. 6727	6	1.95	1.5	23 40.8	19 15.0	+11 50.7	-0.8268	0.5981	0.0510	-26	-90		
17 Capricorni	6	2.26	5.3	21 54.7	23 20 46.3	-11 40.1	-0.3844	0.5946	0.1212	+6	-65		
η Capricorni	5	2.30	6.6	20 17.3	24 3 55.7	-4 47.8	-1.0720	0.5920	0.1390	-34	-90		
χ Capricorni	5 $\frac{1}{2}$	+2.34	+6.5	-21 38.0	5 32.6	-3 14.9	+0.4975	0.5907	+0.1428	+56	-13		
27 Capricorni	6 $\frac{1}{2}$	2.33	6.8	20 59.7	5 56.1	-2 52.3	-0.0812	0.5907	0.1436	+23	-46		
ϕ Capricorni	5 $\frac{1}{2}$	2.36	7.0	21 6.4	8 20.3	-0 33.8	+0.3815	0.5903	0.1471	+48	-20		
33 Capricorni	5 $\frac{1}{2}$	2.36	7.4	21 19.1	11 43.0	+2 41.0	+1.1111	0.5882	0.1575	+69	+27		
37 Capricorni	6	2.41	8.1	20 34.4	15 59.2	+6 47.0	+1.0630	0.5872	0.1671	+69	+23		
ϵ Capricorni	4 $\frac{1}{2}$	+2.41	+8.4	-19 57.4	16 53.0	+7 38.8	+0.6011	0.5869	+0.1692	+65	-8		
κ Capricorni	5	2.43	8.8	19 21.9	19 7.2	+9 47.8	+0.3974	0.5861	0.1739	+53	-19		
B. A. C. 7550	6 $\frac{1}{2}$	2.43	8.7	20 7.3	19 20.6	+10 0.6	+1.1875	0.5862	0.1744	+70	+34		
29 Aquarii <i>mult.</i>	6 $\frac{1}{2}$	2.45	10.1	17 29.4	25 3 8.7	-6 29.3	-0.0017	0.5820	0.1901	+32	-41		
56 Aquarii	6 $\frac{1}{2}$	2.47	12.0	15 8.6	14 37.8	+4 33.7	-0.0214	0.5764	0.2106	+33	-42		
γ^1 Aquarii <i>mult.</i>	5 $\frac{1}{2}$	+2.50	+12.8	-14 37.9	21 55.6	+11 35.1	+1.0510	0.5722	+0.2216	+75	+19		
γ^2 Aquarii	4	2.50	13.0	14 10.2	22 43.8	-11 38.4	+0.7705	0.5722	0.2227	+71	+1		
74 Aquarii	6	2.48	13.2	12 11.9	26 0 22.8	-10 3.0	-0.8117	0.5711	0.2249	-8	-90		
ψ^1 Aquarii	4	2.47	14.3	9 41.0	9 56.0	-0 50.7	-1.0940	0.5661	0.2364	-25	-90		
ψ^2 Aquarii	4	2.49	14.4	9 46.8	10 49.0	+0 0.4	-0.7903	0.5657	0.2375	-5	-90		
ψ^3 Aquarii	4 $\frac{1}{2}$	+2.49	+14.5	-10 12.5	11 16.0	+0 26.5	-0.2590	0.5657	+0.2378	+24	-56		
30 Piscium	4 $\frac{1}{2}$	+2.50	+15.8	-6 37.3	27 6 5.0	-5 24.6	+0.8162	0.5580	+0.2523	+83	+3		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
33 Piscium	5	+2.50	+15.9	- 6 19.1	27 7 35.1	- 3 57.6	+0.8939	0.5575	+0.2530	+84°	+ 8°
B. A. C. 17	6	2.54	16.0	- 5 51.2	9 47.8	- 1 49.5	+0.9033	0.5573	0.2543	+84	+14
26 Ceti	6	2.45	16.4	+ 0 46.9	28 9 54.6	- 2 32.3	+0.5585	0.5502	0.2564	+76	-11
29 Ceti	64	2.44	16.5	1 25.4	11 48.7	- 0 42.0	+0.4014	0.5494	0.2555	+65	-20
33 Ceti	6	2.45	16.3	1 52.0	12 59.2	+ 0 26.1	+0.2575	0.5489	0.2552	+55	-27
35 Ceti	64	+2.44	+16.4	+ 1 53.7	13 53.1	+ 1 18.2	+0.4589	0.5495	+0.2552	+69	-16
f Piscium	5	2.44	16.3	3 2.4	16 17.4	+ 3 37.7	-0.0787	0.5484	0.2540	+37	-44
μ Piscium	5	2.44	16.6	5 34.9	21 55.2	+ 9 4.1	-1.2150	0.5484	0.2516	-31	-84
ν Piscium	44	2.42	16.1	4 56.1	20 3 6.0	- 9 55.6	+0.7304	0.5476	0.2483	+90	+ 2
64 Ceti	54	2.39	15.2	8 3.5	16 49.0	+ 3 19.9	+0.9082	0.5471	0.2375	+90	+11
ξ Ceti	44	+2.45	+15.1	+ 8 20.0	17 33.8	+ 4 3.1	+0.8029	0.5468	+0.2368	+90	+ 5
ξ Arietis	54	2.40	14.5	10 6.9	22 57.8	+ 9 16.3	+0.2521	0.5474	0.2314	+55	-25
B. A. C. 755	64	2.40	14.5	10 4.3	23 51.3	+10 7.9	+0.5034	0.5476	0.2305	+72	-12
31 Arietis	54	2.41	13.9	11 58.5	30 4 20.3	- 9 32.0	-0.4256	0.5475	0.2251	+18	-62
38 Arietis	5	+2.38	+13.7	+11 59.2	8 9.6	- 5 50.5	+0.4109	0.5474	+0.2204	+66	-15

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B. A. C. 1119	6	+2.29	+10.9	+16 10.9	1 8 53.2	- 5 57.0	+1.1030	0.5505	+0.1840	+90	+31
B. A. C. 1240	6	2.24	9.5	17 53.2	18 29.8	+ 3 19.9	+1.0090	0.5517	0.1669	+90	+25
B. A. C. 1242	64	+2.26	+ 9.0	+19 53.6	18 36.0	+ 3 25.9	-1.0850	0.5517	+0.1665	-24	-70
ω Tauri	6	2.23	8.8	19 19.2	22 13.6	+ 6 56.0	+0.1088	0.5520	0.1597	+48	-24
ω Tauri	54	2.23	8.3	20 18.6	2 1 50.8	+10 25.8	-0.3714	0.5526	0.1529	+20	-50
53 Tauri	6	2.23	8.0	20 52.7	2 48.2	+11 21.2	-0.8229	0.5524	0.1509	- 6	-69
NEPTUNE				19 48.5	6 9.5	- 9 24.5	+0.8005	0.5530	0.1446	+90	+15
B. A. C. 1373	6	+2.20	+ 7.5	+21 22.5	6 37.8	- 8 57.1	-0.7885	0.5526	+0.1434	+ 4	-69
W. iv, 650	6	2.14	7.2	20 27.9	11 14.0	- 4 30.5	+0.8141	0.5534	0.1342	+90	+16
ϵ Tauri	5	2.03	6.0	21 26.0	22 16.2	+ 6 8.8	+1.1450	0.5550	0.1111	+90	+43
108 Tauri	64	1.93	5.1	22 9.7	3 3 45.3	+11 26.5	+0.9430	0.5546	0.0990	+90	+28
121 Tauri	6	1.96	3.6	23 57.9	12 35.4	- 4 1.8	-0.2029	0.5547	0.0796	+30	-33
B. A. C. 1801	6	+1.90	+ 3.6	+23 9.2	16 6.3	- 0 38.3	+0.9386	0.5545	+0.0716	+90	+31
132 Tauri	54	1.90	3.2	24 31.8	18 36.0	+ 1 46.2	-0.3783	0.5547	0.0659	+19	-41
2 Geminorum	7	1.82	2.4	23 38.8	4 2 31.8	+ 9 25.5	+1.0330	0.5542	0.0479	+90	+40
5 Geminorum	64	1.77	2.0	24 26.6	4 36.8	+11 26.1	+0.2626	0.5545	0.0430	+57	- 5
9 Geminorum	64	1.77	1.8	23 46.7	7 3.2	-10 12.6	+1.0850	0.5545	0.0375	+90	+44
ϵ Geminorum	34	+1.63	+ 0.4	+25 14.4	19 4.1	+ 1 23.4	-0.2204	0.5522	+0.0100	+28	-27
37 Geminorum	64	1.57	- 0.3	25 30.7	5 0 10.7	+ 6 19.5	-0.4964	0.5512	-0.0016	+13	-44
ω Geminorum	54	1.55	0.2	24 22.2	4 24.2	+10 26.5	+0.7296	0.5504	0.0110	+90	+23
48 Geminorum	6	1.48	0.6	24 18.8	7 56.6	-10 10.6	+0.7369	0.5493	0.0188	+90	+23
52 Geminorum	64	1.49	0.9	25 4.5	8 56.8	- 9 12.4	-0.1190	0.5495	0.0213	+34	-23
A Geminorum	54	+1.43	- 1.3	+25 15.6	12 56.4	- 5 21.0	-0.4232	0.5476	-0.0300	+17	-41
κ Geminor. mult.	34	1.30	1.8	24 39.7	22 33.7	+ 3 56.9	-0.1581	0.5454	0.0509	+32	-28
62 Geminorum	64	1.29	1.5	23 24.7	6 0 29.0	+ 5 48.3	+1.1210	0.5449	0.0551	+90	+46
μ Cancri	64	1.18	1.9	22 57.0	8 44.0	-10 13.1	+1.1070	0.5419	0.0721	+90	+43
λ Cancri	54	1.11	2.8	24 22.1	15 22.9	- 3 47.4	-0.9891	0.5399	0.0859	-19	-66
γ Cancri	44	+0.88	- 2.7	+21 51.9	7 2 14.8	+ 6 43.5	+0.7362	0.5352	-0.1067	+90	+14
B. A. C. 3138	64	0.81	3.3	21 44.2	16 56.7	- 3 2.6	-0.8855	0.5292	0.1331	-10	-68
B. A. C. 3206	64	0.74	3.0	20 15.8	22 27.5	+ 2 17.8	-0.0112	0.5272	0.1424	+40	-29
η Leonis	34	0.54	2.8	17 17.9	8 19 53.7	- 0 55.2	-0.1255	0.5192	0.1742	+34	-39
42 Leonis	6	0.48	2.6	15 31.8	9 3 21.6	+ 6 19.3	+0.4937	0.5166	0.1837	+73	- 9
i Leonis	54	+0.44	- 2.5	+14 42.0	8 43.8	+11 32.0	+0.4070	0.5153	-0.1903	+66	-14
k Leonis	54	0.38	2.5	14 46.5	16 9.2	- 5 15.7	-1.1190	0.5129	0.1908	-25	-75
l Leonis	4	0.25	2.2	11 8.1	10 11 58.1	-10 1.1	-1.2380	0.5093	0.2176	-34	-79
ω Virginis	6	0.30	1.8	8 44.6	19 44.9	- 2 27.5	-0.3272	0.5084	0.2233	+24	-58
ξ Virginis	54	0.19	1.8	8 52.2	23 23.2	+ 1 4.4	-1.2830	0.5063	0.2258	-39	-81
ν Virginis	4	+0.18	- 1.6	+ 7 8.8	23 42.0	+ 1 22.7	+0.5328	0.5080	-0.2259	+75	-12
c Virginis	54	+0.11	- 1.4	+ 3 55.5	12 18 11.6	- 4 39.3	-0.2196	0.5078	-0.2350	+29	-53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle <i>H</i>	<i>Y</i>	<i>z'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$	α δ	d h m	h m				°	°
					NEW MOON.						
κ Virginie	4 $\frac{1}{2}$	+0.11	-2.1	-9 45.7	14 4 51.8	+4 18.4	+0.6465	0.5238	-0.2291	+78	-7
μ Libræ	5 $\frac{1}{2}$	0.13	2.2	13 41.5	22 44.2	-2 22.6	+0.8604	0.5342	0.2138	+76	+6
σ Libræ	6 $\frac{1}{2}$	0.21	2.4	15 9.1	15 13 44.5	-11 51.4	-0.6784	0.5440	0.1963	-2	-90
σ Libræ	6 $\frac{1}{2}$	+0.22	-2.2	-14 44.6	14 40.9	-10 56.9	-1.2940	0.5450	-0.1953	-48	-90
ζ Libræ	6	0.24	2.5	16 20.0	17 4.6	-8 38.0	-0.0790	0.5460	0.1916	+23	-45
ζ Libræ	7	0.24	2.7	17 3.8	17 40.7	-8 3.1	+0.5737	0.5462	0.1909	+67	-10
ζ Libræ	6	0.25	2.9	16 13.9	18 11.5	-7 33.3	-0.4000	0.5468	0.1902	+13	-66
ζ Libræ	5 $\frac{1}{2}$	0.25	2.5	16 28.8	19 13.3	-6 33.5	-0.3351	0.5474	0.1890	+16	-61
47 Libræ	6 $\frac{1}{2}$	+0.33	-3.0	-19 3.5	16 5 11.5	+3 4.4	+0.5689	0.5530	-0.1731	+64	-10
β Scorpii	2	0.37	3.0	19 30.3	9 49.6	+7 32.9	+0.2496	0.5573	0.1654	+44	-27
β Scorpii	5 $\frac{1}{2}$	0.37	3.0	19 30.1	9 49.9	+7 33.2	+0.2460	0.5573	0.1654	+43	-27
ω Scorpii	4 $\frac{1}{2}$	0.38	3.2	20 22.3	10 25.0	+8 7.0	+1.0590	0.5573	0.1640	+70	+22
ω Scorpii	4 $\frac{1}{2}$	0.40	3.2	20 34.3	10 40.5	+8 21.9	+1.2260	0.5571	0.1638	+69	+39
ν Scorpii	4 $\frac{1}{2}$	+0.39	-2.8	-19 10.6	12 43.5	+10 20.7	-0.5644	0.5588	-0.1603	0	-79
ψ Ophiuchi	4 $\frac{1}{2}$	0.45	2.9	19 46.9	18 0.0	-8 34.1	-0.7511	0.5624	0.1499	-11	-90
ω Ophiuchi	4 $\frac{1}{2}$	0.49	3.2	21 13.9	21 26.2	-5 15.2	+0.2573	0.5653	0.1434	+42	-27
22 Ophiuchi	6 $\frac{1}{2}$	0.59	3.5	23 19.9	17 7 3.1	+4 0.7	+1.1550	0.5707	0.1232	+67	+33
39 Ophiuchi	5 $\frac{1}{2}$	0.71	3.5	24 10.1	16 40.6	-10 43.4	+0.9395	0.5764	0.1008	+66	+15
B. A. C. 5831	6	+0.71	-3.5	-23 57.1	16 43.1	-10 41.0	+0.7120	0.5764	-0.1008	+66	0
b Ophiuchi	5	0.76	3.4	24 4.4	20 6.5	-7 25.3	+0.5103	0.5789	0.0913	+52	-12
c Ophiuchi	5	0.78	3.3	23 52.6	22 10.4	-5 26.1	+0.1190	0.5805	0.0874	+29	-34
63 Ophiuchi	6 $\frac{1}{2}$	0.92	3.1	24 51.9	18 7 39.1	+3 40.8	+0.4209	0.5841	0.0635	+44	-17
4 Sagittarii	5 $\frac{1}{2}$	0.94	2.7	23 48.3	9 38.0	+5 35.0	-0.7921	0.5852	0.0586	-23	-90
7 Sagittarii	6	+0.96	-2.7	-24 16.8	10 50.8	+6 45.0	-0.3704	0.5852	-0.0552	0	-65
9 Sagittarii	6	0.97	2.7	24 21.8	11 15.2	+7 8.5	-0.3087	0.5852	0.0541	+4	-60
B. A. C. 6161	5 $\frac{1}{2}$	0.95	2.3	23 43.5	14 23.7	+10 9.6	-1.1210	0.5871	0.0457	-46	-90
λ Sagittarii	3	1.11	2.5	25 28.9	20 48.1	-7 41.2	+0.4469	0.5891	0.0285	+42	-16
24 Sagittarii	6	1.14	1.9	24 6.8	23 9.8	-5 25.1	-1.0150	0.5891	0.0217	-41	-90
25 Sagittarii	6 $\frac{1}{2}$	+1.14	-1.9	-24 18.3	23 25.1	-5 10.3	-0.2954	0.5894	-0.0208	-28	-90
B. A. C. 6369	6	1.20	1.9	25 7.2	19 3 26.7	-1 18.4	-0.0512	0.5901	-0.0097	+12	-45
σ Sagittarii	2 $\frac{1}{2}$	1.27	2.1	26 25.9	7 30.9	+2 36.2	+1.2760	0.5913	+0.0014	+64	+63
ρ Sagittarii	5 $\frac{1}{2}$	1.38	1.1	25 26.7	15 28.3	+10 13.7	+0.3652	0.5932	0.0239	+37	-20
χ Sagittarii	5 $\frac{1}{2}$	1.33	0.5	24 43.3	19 17.6	-10 5.4	-0.2619	0.5920	0.0343	+4	-57
γ Sagittarii	6 $\frac{1}{2}$	+1.33	-0.4	-24 37.6	19 20.2	-10 2.8	-0.3587	0.5920	+0.0347	+2	-64
γ Sagittarii	5 $\frac{1}{2}$	1.43	0.3	24 10.7	19 23.6	-9 59.5	-0.8112	0.5920	0.0349	-26	-90
MARS				24 25.4	19 25.6	-9 57.4	-0.6102	0.6121	0.0334	-15	-87
Λ Sagittarii	6	1.50	0.2	24 57.6	23 30.0	-6 3.0	+0.1511	0.5913	0.0464	+27	-32
Λ Sagittarii	4 $\frac{1}{2}$	1.51	-0.2	25 7.5	23 45.6	-5 48.0	+0.3310	0.5913	0.0470	+37	-22
53 Sagittarii	6 $\frac{1}{2}$	+1.49	+0.3	-23 40.6	20 1 0.6	-4 36.0	-1.0810	0.5915	+0.0504	-44	-90
B. A. C. 6727	6	1.49	0.4	23 40.8	1 7.5	-4 29.4	-1.0730	0.5915	0.0509	-42	-90
17 Capricorni	6	1.84	3.5	21 54.7	21 3 15.5	+3 23.4	-0.6123	0.5856	0.1200	-8	-86
γ Capricorni	5 $\frac{1}{2}$	1.96	4.7	21 38.0	12 17.1	+5 17.2	+0.2695	0.5817	0.1414	+43	-25
27 Capricorni	6 $\frac{1}{2}$	1.94	4.9	20 59.7	12 41.4	+5 40.5	-0.2996	0.5816	0.1424	+11	-59
ϕ Capricorni	5 $\frac{1}{2}$	+1.99	+5.0	-21 6.4	15 10.0	+8 3.5	+0.1751	0.5805	+0.1484	+37	-31
23 Capricorni	5 $\frac{1}{2}$	2.03	5.4	21 19.1	18 38.9	+11 24.4	+0.9175	0.5785	0.1555	+69	+12
37 Capricorni	6	2.07	6.0	20 34.4	23 3.6	-8 20.9	+0.8740	0.5777	0.1657	+69	+12
r Capricorni	4 $\frac{1}{2}$	2.08	6.4	19 57.4	23 58.9	-7 27.7	+0.4067	0.5767	0.1677	+53	-16
κ Capricorni	5	2.09	6.6	19 21.9	23 2 17.4	-5 14.4	+0.2033	0.5757	0.1723	+41	-27
B. A. C. 7550	6 $\frac{1}{2}$	+2.10	+6.5	-20 7.3	2 31.3	-5 1.1	+1.0070	0.5757	+0.1728	+70	+21
29 Aquarii <i>mult.</i>	6 $\frac{1}{2}$	2.16	8.1	17 29.4	10 34.8	+2 4.4	-0.1913	0.5712	0.1879	+23	-49
56 Aquarii	6 $\frac{1}{2}$	2.25	10.2	15 8.6	22 27.0	-9 49.4	-0.1926	0.5654	0.2082	+24	-49
τ Aquarii <i>mult.</i>	5 $\frac{1}{2}$	2.30	10.9	14 37.9	23 5 59.6	-2 33.1	+0.9059	0.5616	0.2196	+75	+12
τ Aquarii	4	2.31	11.1	14 10.2	6 49.1	-1 45.3	+0.6248	0.5616	0.2206	+73	-5
74 Aquarii	6	+2.31	+11.6	-12 11.9	8 31.5	-0 6.6	-0.9781	0.5608	+0.2229	-18	-90
ψ Aquarii	4	+2.37	+13.0	-9 41.0	18 23.5	+9 24.7	-1.2470	0.5666	+0.2345	-38	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1800.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	E.
		$\Delta\alpha$	$\Delta\delta$		d h m	b m					
ψ^2 Aquarii	4	+2.38	+13.1	- 9 46.8	23 19 18.3	+10 17.6	-0.9345	0.5566	+0.2353	-13	-90
ψ^2 Aquarii	4 $\frac{1}{2}$	2.38	13.1	10 12.5	19 46.3	+10 44.6	-0.3951	0.5563	0.2360	+18	-62
30 Piscium	4 $\frac{1}{2}$	2.49	14.8	6 37.4	24 15 8.9	+ 5 27.3	+0.4628	0.5493	0.2509	+68	-14
33 Piscium	5	2.50	15.0	6 19.2	16 41.4	+ 6 56.7	+0.8189	0.5499	0.2520	+84	+ 3
B. A. C. 17	6	2.51	15.2	5 51.3	18 57.8	+ 9 8.4	+0.9245	0.5491	0.2530	+84	+ 9
14 Ceti	6	+2.48	+16.2	- 1 6.4	25 6 32.5	- 3 40.2	-0.9057	0.5465	+0.2564	- 9	-90
15 Ceti	6 $\frac{1}{2}$	2.55	16.2	- 1 6.4	7 43.0	- 2 32.1	-0.6050	0.5462	0.2564	+ 9	-80
26 Ceti	6	2.62	16.4	+ 0 46.8	19 36.7	+ 8 57.9	+0.5448	0.5453	0.2565	+75	-12
33 Ceti	6	2.63	16.6	1 51.9	22 44.3	+11 59.3	+0.2456	0.5448	0.2557	+55	-28
f Piscium	5	2.64	16.5	3 2.3	26 2 5.7	- 8 46.0	-0.0844	0.5450	0.2548	+36	-45
μ Piscium	5	+2.68	+17.2	+ 5 34.9	7 48.2	- 3 14.8	-1.2180	0.5452	+0.2520	-31	-84
ν Piscium	4 $\frac{1}{2}$	2.68	16.5	4 56.1	13 2.6	+ 1 49.1	+0.7546	0.5445	0.2494	+90	0
64 Ceti	5 $\frac{1}{2}$	2.74	16.0	8 3.6	27 2 51.6	- 8 49.4	+0.9607	0.5464	0.2395	+90	+14
ξ^1 Ceti	4 $\frac{1}{2}$	2.74	16.0	8 20.1	3 36.7	- 8 5.9	+0.8602	0.5464	0.2388	+90	+ 8
ξ Arietis	5 $\frac{1}{2}$	2.77	15.6	10 6.9	9 1.6	- 2 51.8	+0.3174	0.5474	0.2334	+58	-22
31 Arietis	5 $\frac{1}{2}$	+2.80	+15.3	+11 58.5	14 24.5	+ 2 20.3	-0.3493	0.5483	+0.2278	+20	-57
38 Arietis	5	2.80	15.0	11 59.2	18 13.6	+ 6 1.7	+0.5025	0.5490	0.2238	+73	-11
B. A. C. 1119	6	2.85	12.4	16 10.9	28 18 47.8	+ 5 45.6	+1.2310	0.5540	0.1868	+90	+42
B. A. C. 1240	6	2.86	10.0	17 53.2	29 4 17.7	- 9 4.2	+1.1520	0.5564	0.1700	+90	+37
B. A. C. 1242	6 $\frac{1}{2}$	2.82	10.7	19 53.6	4 23.9	- 8 58.2	-0.9319	0.5567	0.1694	-12	-70
ω^1 Tauri	6	+2.89	+10.4	+19 19.2	7 58.5	- 5 31.1	+0.2639	0.5569	+0.1629	+56	-16
ω^2 Tauri	5 $\frac{1}{2}$	2.88	9.8	20 18.6	11 32.5	- 2 4.5	-0.2084	0.5576	0.1557	+30	-40
53 Tauri	6	2.85	9.6	20 52.7	12 29.1	- 1 9.8	-0.6584	0.5573	0.1537	+ 5	-67
NEPTUNE				19 42.5	14 50.8	+ 1 6.9	+0.9299	0.5590	0.1493	+90	+23
B. A. C. 1373	6	2.89	9.0	21 22.6	16 15.2	+ 2 28.3	-0.6193	0.5578	0.1462	+ 7	-64
W. iv, 650	6	+2.84	+ 8.5	+20 28.0	20 47.0	+ 6 50.5	+0.9824	0.5594	+0.1370	+90	+27
τ Tauri	4 $\frac{1}{2}$	2.87	7.9	22 45.0	22 28.9	+ 8 28.9	-1.2000	0.5592	0.1329	-37	-47
108 Tauri	6 $\frac{1}{2}$	2.79	5.9	22 9.7	30 13 0.7	- 1 30.1	+1.1300	0.5615	0.1013	+90	+42
121 Tauri	6	2.78	4.1	23 58.0	21 42.1	+ 6 52.8	-0.0036	0.5606	0.0814	+41	-22
B. A. C. 1801	6	2.72	3.9	23 9.3	31 1 7.7	+10 11.1	+1.1320	0.5606	0.0734	+90	+45
132 Tauri	5 $\frac{1}{2}$	+2.77	+ 3.4	+24 31.9	3 34.6	-11 27.3	-0.1718	0.5608	+0.0674	+31	-30
5 Geminorum	6 $\frac{1}{2}$	+2.62	+ 1.7	+24 26.6	13 24.3	- 1 58.5	+0.4748	0.5599	+0.0440	+73	+ 7

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ϵ Geminorum	3 $\frac{1}{2}$	+2.57	- 0.5	+25 14.4	1 3 35.7	+11 42.8	+0.0018	0.5571	+0.0105	+41	-15
37 Geminorum	6 $\frac{1}{2}$	2.51	1.4	25 30.6	8 37.2	- 7 26.1	-0.2681	0.5555	-0.0007	+26	-29
39 Geminorum	6 $\frac{1}{2}$	2.51	1.8	26 13.4	10 9.1	- 5 57.5	-1.0510	0.5558	0.0047	-25	-64
40 Geminorum	6 $\frac{1}{2}$	2.50	1.8	26 3.7	10 26.8	- 5 40.5	-0.8766	0.5555	0.0054	-11	-64
ω Geminorum	5 $\frac{1}{2}$	2.45	1.5	24 22.1	11 47.5	- 4 22.5	+0.9583	0.5549	0.0085	+90	+38
48 Geminorum	6	+2.40	- 2.2	+24 18.7	16 15.5	- 0 3.9	+0.9618	0.5536	-0.0189	+90	+37
52 Geminorum	6 $\frac{1}{2}$	2.40	2.5	25 4.4	17 14.8	+ 0 53.4	+0.1091	0.5530	0.0213	+48	-11
A Geminorum	5 $\frac{1}{2}$	2.35	3.0	25 15.5	21 11.0	+ 4 41.4	-0.1931	0.5520	0.0301	+30	-28
κ Geminor. mult.	3 $\frac{1}{2}$	2.25	4.1	24 39.6	2 6 40.3	-10 8.7	+0.0768	0.5484	0.0514	+46	-15
ω^1 Cancri	6 $\frac{1}{2}$	2.15	5.2	25 23.4	14 33.9	- 2 31.1	-1.1990	0.5449	0.0680	-40	-65
λ Cancri	5 $\frac{1}{2}$	+2.00	- 5.7	+24 22.0	23 18.5	+ 5 56.0	-0.7506	0.5408	-0.0858	- 2	-66
ν^1 Cancri	5 $\frac{1}{2}$	2.00	6.3	24 30.5	3 3 5.6	+ 9 35.6	-1.2500	0.5398	0.0936	-48	-65
γ Cancri	4 $\frac{1}{2}$	1.87	6.2	21 51.8	10 5.5	- 7 38.1	+0.9632	0.5358	0.1072	+90	+29
ξ Cancri	5	1.68	7.2	22 29.3	22 37.8	+ 4 30.1	-1.2133	0.5296	0.1297	-39	-64
79 Cancri	6 $\frac{1}{2}$	1.70	7.2	22 26.4	23 6.8	+ 4 54.2	-1.2210	0.5294	0.1306	-40	-68
B. A. C. 3138	6 $\frac{1}{2}$	+1.60	- 7.3	+21 44.1	4 0 43.4	+ 6 31.8	-0.6556	0.5284	-0.1332	+ 4	-65
B. A. C. 3206	6 $\frac{1}{2}$	1.60	7.2	20 15.7	6 13.6	+11 51.6	+0.2140	0.5265	0.1427	+54	-18
η Leonis	3 $\frac{1}{2}$	1.37	7.4	17 17.8	5 3 40.4	+ 8 39.2	+0.0867	0.5172	0.1744	+46	-28
42 Leonis	6	1.22	7.1	15 31.7	11 9.7	- 8 4.9	+0.6980	0.5144	0.1843	+90	+ 3
i Leonis	5 $\frac{1}{2}$	1.15	7.3	14 41.9	16 32.9	- 2 51.2	+0.6078	0.5128	0.1905	+82	- 3
k Leonis	5 $\frac{1}{2}$	+1.08	- 7.5	+14 46.4	6 0 0.3	+ 4 23.1	-0.9284	0.5098	-0.1987	-11	-75
l Leonis mult.	4	+0.86	- 6.9	+11 8.0	19 56.0	- 0 15.5	-1.0700	0.5063	-0.2177	-20	-79

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	γ'	α'	γ''	N	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
ω Virginis	6	+0.79	-6.3	+8 44.5	7 3 45.0	+7 20.2	-0.1682	0.5054	-0.2237	+32	-48	
ξ Virginis	5½	0.76	6.5	8 52.1	7 24.7	+10 53.7	-1.1300	0.5050	0.2259	-24	-81	
ν Virginis	4	0.75	6.0	7 8.7	7 43.7	+11 12.2	+0.6861	0.5051	0.2261	+89	+4	
π Virginis	4½	0.68	6.1	7 13.5	15 48.6	-4 56.6	-1.2460	0.5047	0.2308	-34	-83	
ϵ Virginis	5½	0.61	5.3	3 55.4	8 2 18.1	+5 15.0	-0.0960	0.5052	0.2355	+36	-45	
B. A. C. 4254	6	+0.54	-5.1	+2 27.6	11 56.5	-9 23.0	-0.7956	0.5075	-0.2391	-1	-72	
65 Virginis	6	0.49	3.9	-4 21.0	9 11 38.0	-10 22.4	+0.8568	0.5142	0.2404	+86	+5	
66 Virginis	6	0.39	3.9	4 35.4	12 16.0	-9 45.5	+0.9623	0.5144	0.2404	+85	+11	
1 st Virginis	5	0.37	3.8	5 41.4	16 6.9	-6 1.4	+1.2140	0.5165	0.2397	+84	+30	
80 Virginis	6	0.37	3.9	4 50.2	17 57.0	-4 14.6	-0.1390	0.5169	0.2391	+33	-49	
88 Virginis	6½	+0.35	-3.7	-6 17.4	10 0 29.0	+2 5.8	-0.1406	0.5202	-0.2372	+33	-49	
B. A. C. 4647	6½	0.34	3.6	7 31.1	3 51.9	+5 22.6	+0.3688	0.5211	0.2355	+61	-22	
κ Virginis	4½	0.31	3.3	9 45.8	12 48.8	-9 56.9	+0.6625	0.5262	0.2310	+79	-6	
NEW MOON.												
β^1 Scorpii	2	+0.34	-2.9	-19 30.3	12 16 55.8	-7 34.2	+0.1796	0.5631	-0.1688	+40	-31	
ψ Ophiuchi	4½	0.36	2.8	19 46.9	13 0 55.7	+0 9.2	-0.8224	0.5698	0.1536	-15	-90	
ω Ophiuchi	4½	0.39	2.9	21 13.9	4 17.4	+3 23.5	+0.1739	0.5716	0.1468	+37	-31	
39 Ophiuchi	5½	0.52	2.9	24 10.1	23 6.0	-2 30.5	+0.8289	0.5840	0.1300	+66	+5	
B. A. C. 5831	6½	0.53	2.9	23 57.2	23 8.4	-2 28.2	+0.6033	0.5842	0.1029	+59	-7	
b Ophiuchi <i>var.</i>	5	+0.56	-2.8	-24 4.5	14 2 27.3	+0 43.0	+0.3982	0.5860	-0.0950	+45	-19	
c^2 Ophiuchi	5	0.58	2.7	23 52.7	4 28.4	+2 39.4	+0.0103	0.5865	0.0898	+23	-41	
63 Ophiuchi	6½	0.66	2.6	24 51.9	13 45.0	+11 34.2	+0.2981	0.5908	0.0655	+36	-24	
4 Sagittarii	5½	0.67	2.3	23 48.3	15 41.4	-10 34.1	-0.9061	0.5919	0.0598	-30	-90	
7 Sagittarii	6	0.69	2.3	24 16.8	16 52.8	-9 25.6	-0.4897	0.5916	0.0569	-7	-74	
9 Sagittarii	6	+0.69	-2.3	-24 21.8	17 16.6	-9 2.7	-0.4268	0.5916	-0.0558	-4	-69	
B. A. C. 6161	5½	0.72	2.0	23 43.5	20 21.2	-6 5.5	-1.2363	0.5932	0.0470	-59	-90	
λ Sagittarii	3	0.79	2.1	25 28.9	15 2 38.2	-0 3.6	+0.3157	0.5946	0.0295	+34	-23	
24 Sagittarii	6	0.81	1.8	24 6.8	4 57.4	+2 9.9	-1.1390	0.5957	0.0227	-50	-90	
25 Sagittarii	6½	0.82	1.5	24 18.3	5 12.5	+2 24.5	-0.9491	0.5954	0.0221	-36	-90	
B. A. C. 6369	6	+0.86	-1.8	-25 7.2	9 9.9	+6 12.2	-0.1833	0.5965	-0.0107	+6	-53	
σ Sagittarii	2½	0.92	1.9	26 25.9	13 10.0	+10 2.7	+1.1310	0.5965	+0.0009	+64	+33	
ψ Sagittarii	5½	1.01	1.2	25 26.7	21 0.3	-6 26.4	+0.2153	0.5967	0.0237	+29	-29	
χ^1 Sagittarii	5½	1.04	0.8	24 43.3	16 0 46.6	-2 49.0	-0.4044	0.5958	0.0341	-4	-68	
χ^2 Sagittarii	6½	1.04	0.7	24 37.6	0 49.2	-2 46.5	-0.4992	0.5958	0.0344	-9	-75	
χ^3 Sagittarii	5½	+1.16	-0.6	-24 10.7	0 52.6	-2 43.2	-0.9528	0.5958	+0.0345	-35	-90	
λ^1 Sagittarii	6	1.12	0.6	24 57.6	4 56.0	+1 10.4	+0.0068	0.5954	0.0461	+18	-41	
λ^2 Sagittarii	4½	1.12	0.6	25 7.5	5 11.4	+1 25.1	+0.1861	0.5951	0.0464	+29	-30	
53 Sagittarii	6½	1.12	0.1	23 40.6	6 25.6	+2 36.3	-1.2320	0.5949	0.0504	-58	-90	
B. A. C. 6727	6	1.12	-0.1	23 40.8	6 32.5	+2 43.0	-1.2170	0.5949	0 0507	-57	-90	
17 Capricorni	6	+1.44	+2.3	-21 54.7	17 8 32.0	+3 40.4	-0.7663	0.5851	+0.1198	-16	-90	
γ Capricorni	5½	1.55	3.2	21 38.0	17 34.8	-11 37.8	+0.1350	0.5801	0.1415	+34	-34	
27 Capricorni	6½	1.55	3.5	20 59.7	17 59.1	-11 14.4	-0.4543	0.5808	0.1425	+4	-71	
ϕ Capricorni	5½	1.58	3.5	21 6.4	20 28.3	-8 50.8	+0.0186	0.5790	0.1482	+28	-40	
33 Capricorni	5½	1.63	3.7	21 19.1	23 58.6	-5 28.9	+0.7313	0.5768	0 1558	+68	0	
37 Capricorni	6	+1.67	+4.2	-20 34.4	18 4 25.0	-1 12.2	+0.7246	0.5741	+0.1650	+70	-1	
ϵ Capricorni	4½	1.77	4.6	19 57.4	5 21.1	-0 18.2	+0.2551	0.5737	0.1665	+43	-27	
κ Capricorni	5	1.70	4.9	19 21.9	7 41.0	+1 56.5	+0.0507	0.5724	0.1714	+33	-38	
B. A. C. 7550	6½	1.71	4.6	20 7.3	7 55.0	+2 10.0	+0.8564	0.5724	0.1720	+70	+7	
29 Aquarii <i>mult.</i>	6½	1.79	6.2	17 29.5	16 4.1	+10 1.1	-0.3429	0.5666	0.1875	+15	-62	
56 Aquarii	6½	+1.90	+8.1	-15 8.7	19 4 7.7	-2 21.3	-0.3394	0.5598	+0.2070	+17	-61	
τ^1 Aquarii <i>mult.</i>	5½	1.99	8.7	14 38.0	11 49.0	+5 3.7	+0.7720	0.5549	0.2174	+70	+1	
τ^2 Aquarii	4	1.99	9.0	14 10.2	12 39.4	+5 52.4	+0.4848	0.5545	0.2184	+64	-15	
74 Aquarii	6	2.00	9.5	12 11.9	14 24.1	+7 33.5	-1.1300	0.5533	0.2210	-28	-90	
ψ^2 Aquarii	4	2.07	11.0	9 46.8	20 1 25.7	-5 47.6	-1.0810	0.5482	0.2330	-23	-90	
ν^2 Aquarii	4½	+2.10	+11.0	-10 12.5	1 54.4	-5 19.8	-0.5347	0.5480	+0.2335	+10	-75	
B. A. C. 8284	7	+2.24	+12.6	-6 59.3	15 32.5	+7 50.8	-0.5458	0.5428	+0.2444	+11	-76	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
30 Piscium	4½	+2.30	+12.8	- 6 37.4	20 21 48.2	-10 5.9	+0.6265	0.5415	+0.2482	+80	- 8
33 Piscium	5	2.31	13.1	6 19.2	23 23.4	- 8 33.8	+0.7147	0.5410	0.2489	+84	- 3
B. A. C. 17	6	2.32	13.2	5 51.3	21 1 43.4	- 6 18.4	+0.8216	0.5403	0.2499	+84	+ 3
14 Ceti	6	2.42	14.7	1 6.4	13 38.4	+ 5 13.3	-1.0190	0.5371	0.2530	-15	-90
15 Ceti	6½	2.43	14.7	- 1 6.4	14 41.9	+ 6 14.4	-0.7516	0.5369	0.2534	+ 2	-90
26 Ceti	6	+2.55	+15.1	+ 0 46.8	22 3 5.6	- 5 45.6	+0.4641	0.5364	+0.2534	+89	-17
29 Ceti	6½	2.57	15.4	1 25.3	5 4.9	- 3 50.0	+0.3106	0.5346	0.2531	+59	-25
33 Ceti	6	2.58	15.4	1 51.9	6 18.6	- 2 38.7	+0.1672	0.5346	0.2527	+50	-32
35 Ceti	6½	2.59	15.3	1 53.6	7 15.1	- 1 44.1	+0.3787	0.5357	0.2525	+63	-21
f Piscium	5	2.61	15.7	3 2.3	9 45.7	+ 0 41.7	-0.1624	0.5364	0.2521	+33	-50
μ Piscium	5	+2.67	+16.4	+ 5 34.8	15 37.8	+ 6 22.5	-1.2980	0.5370	+0.2502	-40	-84
ν Piscium	4½	2.71	15.7	4 56.1	21 0.6	+11 34.9	+0.7020	0.5371	0.2473	+90	- 4
64 Ceti	5½	2.84	15.6	8 3.6	23 11 10.2	+ 1 17.0	+0.9276	0.5395	0.2379	+90	+11
ξ Ceti	4½	2.85	15.6	8 20.1	11 56.3	+ 2 1.5	+0.8262	0.5398	0.2372	+90	+ 6
ξ Arietis	5½	2.91	15.6	10 7.0	17 28.5	+ 7 22.9	+0.2844	0.5409	0.2324	+57	-24
B. A. C. 755	6½	+2.91	+15.6	+10 4.4	18 23.3	+ 8 15.9	+0.5414	0.5409	+0.2314	+76	-10
31 Arietis	5½	2.97	15.5	11 58.6	22 58.1	-11 18.3	-0.3800	0.5425	0.2267	+21	-59
38 Arietis	5	2.99	15.1	11 59.2	24 2 51.6	- 7 32.5	+0.4844	0.5437	0.2223	+71	-12
ω Tauri	5½	3.25	10.6	20 18.6	23 20 39.1	+ 8 50.0	-0.1828	0.5571	0.1567	+31	-39
NEPTUNE				19 34.6	22 37.1	+10 43.9	+0.8948	0.5584	0.1528	+90	+20
τ Tauri	4½	+3.43	+ 8.8	+22 45.0	26 7 37.4	- 4 34.6	-1.1640	0.5595	+0.1344	-33	-67
121 Tauri	6	3.51	4.5	23 58.1	27 6 46.2	- 6 15.1	+0.0535	0.5633	0.0828	+44	-19
132 Tauri	5½	3.46	+ 3.4	24 32.0	12 37.9	- 0 36.1	-0.1108	0.5613	0.0685	+35	-26
ϵ Geminorum	3½	3.38	- 1.3	25 14.5	28 12 26.6	- 1 38.4	+0.0794	0.5613	+0.0110	+46	-11
37 Geminorum	6½	3.34	2.4	25 30.8	17 24.8	+ 3 9.3	-0.1899	0.5598	-0.0013	+30	-25
39 Geminorum	6½	+3.35	- 2.6	+26 13.5	18 55.9	+ 4 37.2	-0.9657	0.5593	-0.0042	-18	-64
40 Geminorum	6½	3.35	3.2	26 3.8	19 13.4	+ 4 54.0	-0.7920	0.5590	0.0051	- 5	-64
ω Geminorum	5½	3.29	3.5	24 22.2	20 33.1	+ 6 11.0	+1.0380	0.5590	0.0081	+90	+43
48 Geminorum	6	3.27	3.6	24 18.8	29 0 58.3	+10 26.8	+1.0410	0.5569	0.0187	+90	+43
52 Geminorum	6½	3.29	3.9	25 4.5	1 57.0	+11 23.5	+0.1938	0.5567	0.0208	+53	- 7
A Geminorum	5½	+3.29	- 4.6	+25 15.6	5 50.5	- 8 51.2	-0.1071	0.5555	-0.0300	+35	-23
κ Geminor. mult.	3½	3.14	6.1	24 39.7	15 13.8	+ 0 12.6	+0.1658	0.5520	0.0510	+51	-10
ω Canceri	6½	3.06	7.5	25 23.4	23 2.4	+ 7 45.2	-1.1043	0.5448	0.0685	-29	-65
λ Canceri	5½	2.97	8.6	24 22.0	30 7 42.1	- 7 52.6	-0.6521	0.5448	0.0864	+ 4	-62
ν Canceri	5½	2.93	9.2	24 30.5	11 27.2	- 4 15.0	-1.1507	0.5429	0.0942	-33	-65
ν Canceri	6	+2.90	- 9.3	+24 27.1	12 48.5	- 2 56.3	-1.2170	0.5423	-0.0966	-41	-66
γ Canceri	4½	+2.79	- 9.5	+21 51.8	18 23.6	+ 2 27.8	+1.0643	0.5394	-0.1079	+90	+36

DECEMBER.

ξ Canceri	5	+2.65	-11.2	+22 29.3	1 6 50.9	- 9 29.0	-1.1130	0.5321	-0.1300	-28	-68
79 Canceri	6½	2.77	11.2	22 26.4	7 19.9	- 9 0.9	-1.1240	0.5319	0.1310	-29	-68
B. A. C. 3138	6½	2.63	11.4	21 44.1	8 55.9	- 7 27.9	-0.5544	0.5307	0.1339	+11	-60
B. A. C. 3206	6½	2.53	11.5	20 15.7	14 24.6	- 2 9.6	+0.3149	0.5271	0.1431	+60	-12
η Leonis	3½	2.24	12.4	17 17.8	21 11 50.0	- 5 23.4	+0.1864	0.5162	0.1744	+52	-23
42 Leonis	6	+2.12	-12.5	+15 31.6	19 20.3	+ 1 53.5	+0.8116	0.5132	-0.1838	+90	+ 9
i Leonis	5½	2.07	12.7	14 41.8	3 0 44.7	+ 7 8.4	+0.7086	0.5113	0.1901	+90	+ 3
k Leonis	5½	1.97	13.0	14 46.3	8 14.3	- 9 35.0	-0.8305	0.5086	0.1984	- 4	-75
i Leonis mult.	4	1.72	12.8	11 7.9	4 4 19.6	+ 9 56.0	-0.9817	0.5029	0.2164	-13	-79
ω Virginis	6	1.69	12.0	8 44.4	12 13.4	- 6 23.5	-0.0807	0.5018	0.2222	+37	-43
ν Virginis	5½	+1.57	-12.2	+ 8 52.1	15 55.8	- 2 47.4	-1.0480	0.5007	-0.2246	-18	-81
ν Virginis	4	1.56	11.6	7 8.7	16 15.5	- 2 28.2	+0.7731	0.5008	0.2248	+90	+ 2
π Virginis	4½	1.48	11.6	7 13.5	5 0 25.8	+ 5 28.5	-1.1720	0.5012	0.2293	-27	-83
ϵ Virginis	5½	1.35	10.8	3 55.4	11 3.5	- 8 11.7	-0.0200	0.5001	0.2339	+40	-41
B. A. C. 4254	6	1.28	10.4	+ 2 27.6	20 49.6	+ 1 18.0	-0.7278	0.5025	0.2374	+ 3	-85
65 Virginis	6	+1.06	- 8.5	- 4 21.0	20 49.1	+ 0 36.7	+0.9139	0.5095	-0.2387	+86	+ 8
i Virginis	5	+1.08	- 8.2	- 5 41.4	7 1 20.9	+ 5 0.6	+1.2700	0.5116	-0.2381	+84	+36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1890.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
80 Virginis	6	+1.04	- 8.4	- 4 50.2	7 3 12.2	+ 6 48.6	-0.0658	0.5133	-0.2380	+36	-46
94 Virginis	6 $\frac{1}{2}$	0.92	7.2	8 22.1	18 56.1	- 1 55.6	-0.0178	0.5210	0.2319	+38	-42
95 Virginis	6	0.92	7.1	8 47.4	19 9.0	- 1 43.0	+0.3823	0.5210	0.2317	+61	-21
κ Virginis	4 $\frac{1}{2}$	0.90	6.9	9 45.8	22 13.8	+ 1 16.2	+0.7013	0.5228	0.2300	+80	- 4
2 Libræ	6 $\frac{1}{2}$	0.88	5.5	11 12.8	8 3 26.3	+ 6 19.0	+1.0440	0.5274	0.2270	+79	+18
μ Libræ	5 $\frac{1}{2}$	+0.81	- 5.9	-13 41.3	15 57.4	- 5 33.7	+0.8652	0.5366	-0.2170	+76	+ 6
ϕ^1 Libræ	6 $\frac{1}{2}$	0.76	5.0	15 9.1	9 6 42.2	+ 8 41.9	-0.6892	0.5490	0.2005	- 2	-90
ζ^1 Libræ	6	0.75	4.8	16 20.0	9 57.6	+11 50.7	-0.1040	0.5522	0.1959	+29	-47
ζ^2 Libræ	6	0.74	4.8	16 13.9	11 3.0	-11 6.1	-0.4221	0.5521	0.1941	+12	-67
ζ^4 Libræ	4 $\frac{1}{2}$	0.74	4.7	16 28.8	12 3.4	-10 7.8	-0.3598	0.5533	0.1928	+15	-63
β^1 Scorpii	2	+0.72	- 4.0	-19 30.3	10 2 14.7	+ 3 33.6	+0.1890	0.5652	-0.1701	+43	-31
β^2 Scorpii	5 $\frac{1}{2}$	0.72	4.0	19 30.1	2 14.8	+ 3 33.7	+0.1856	0.5665	0.1701	+41	-31
ω^1 Scorpii	4 $\frac{1}{2}$	0.72	3.8	20 22.3	2 49.0	+ 4 6.6	+0.9863	0.5675	0.1692	+70	+16
ω^2 Scorpii	4 $\frac{1}{2}$	0.72	3.8	20 34.3	3 3.9	+ 4 21.0	+1.1495	0.5675	0.1684	+69	+30
ν^2 Scorpii	4 $\frac{1}{2}$	0.71	3.9	19 10.6	5 3.0	+ 6 15.7	-0.6191	0.5689	0.1646	- 3	-85
ψ Ophiuchi	4 $\frac{1}{2}$	+0.69	- 3.7	-19 46.9	10 8.5	+11 9.9	-0.8084	0.5725	-0.1546	-15	-90
ω Ophiuchi	4 $\frac{1}{2}$	0.70	3.5	21 13.9	13 27.3	- 9 38.6	+0.1758	0.5761	0.1477	+37	-31
Venus				20 27.2	13 27.3	- 9 38.6	-0.6266	0.6009	0.1630	- 4	-87
NEW MOON.											
λ Sagittarii	3	+0.83	- 1.7	-25 28.9	12 10 46.2	+ 9 52.1	+0.3003	0.6043	-0.0303	+33	-24
MERCURY				25 35.8	11 41.5	+10 45.2	+0.3898	0.5417	-0.0293	+39	-19
ψ Sagittarii	5 $\frac{1}{2}$	0.92	0.6	25 26.7	13 4 36.3	+ 2 57.6	+0.2037	0.6046	+0.0233	+25	-29
χ^1 Sagittarii	5 $\frac{1}{2}$	0.93	0.5	24 43.3	8 15.9	+ 6 28.0	-0.4140	0.6057	0.0344	- 5	-68
χ^2 Sagittarii	6 $\frac{1}{2}$	0.93	0.6	24 37.6	8 18.3	+ 6 30.3	-0.5075	0.6057	0.0347	- 9	-76
χ^3 Sagittarii	5 $\frac{1}{2}$	+0.93	- 0.5	-24 10.7	8 21.4	+ 6 33.3	-0.9548	0.6057	+0.0347	-35	-90
λ^1 Sagittarii	6	0.97	0.4	24 57.6	12 17.8	+10 19.8	-0.0101	0.6054	0.0467	+18	-42
λ^2 Sagittarii	4 $\frac{1}{2}$	0.97	- 0.4	25 7.5	12 32.7	+10 34.1	+0.1633	0.6054	0.0476	+27	-32
17 Capricorni	6	1.19	+ 1.9	21 54.8	14 15 5.4	-11 58.7	-0.7762	0.5949	0.1222	-16	-90
χ Capricorni	5 $\frac{1}{2}$	1.28	2.5	21 38.0	23 53.6	- 3 31.5	+0.1152	0.5889	0.1435	+33	-35
27 Capricorni	6 $\frac{1}{2}$	+1.28	+ 2.7	-20 59.7	15 0 17.4	- 3 8.6	-0.4658	0.5875	+0.1443	+ 4	-72
ϕ Capricorni	5 $\frac{1}{2}$	1.30	2.5	21 6.4	2 42.7	- 0 49.1	0.0000	0.5869	0.1502	+28	-41
33 Capricorni	5 $\frac{1}{2}$	1.34	2.9	21 19.1	6 7.9	+ 2 28.2	+0.7362	0.5838	0.1578	+68	0
35 Capricorni	6	1.35	2.9	21 40.2	7 22.3	+ 3 39.7	+1.2880	0.5829	0.1605	+68	+50
37 Capricorni	6	1.38	3.4	20 34.4	10 28.1	+ 6 38.3	+0.6077	0.5808	0.1669	+70	- 2
ϵ Capricorni	4 $\frac{1}{2}$	+1.39	+ 3.6	-19 57.4	11 22.8	+ 7 31.0	+0.2321	0.5797	+0.1691	+42	-28
κ Capricorni	5	1.41	3.8	19 21.9	13 39.6	+ 9 42.6	+0.0301	0.5791	0.1734	+32	-40
B. A. C. 7550	6 $\frac{1}{2}$	1.42	3.7	20 7.3	13 53.4	+ 9 55.8	+0.8923	0.5790	0.1741	+70	+ 6
29 Aquarii	6 $\frac{1}{2}$	1.49	4.8	17 29.5	21 52.4	- 6 23.2	-0.3595	0.5720	0.1890	+14	-63
56 Aquarii	6 $\frac{1}{2}$	1.59	6.5	15 8.7	16 9 44.0	+ 5 2.4	-0.3557	0.5642	0.2084	+16	-62
γ^1 Aquarii	5 $\frac{1}{2}$	+1.68	+ 7.0	-14 38.0	17 19.2	-11 38.7	+0.7513	0.5584	+0.2188	+73	0
γ^2 Aquarii	4	1.69	7.2	14 10.3	18 9.3	-10 50.4	+0.4672	0.5575	0.2198	+63	-16
74 Aquarii	6	1.69	7.8	12 12.0	19 52.7	- 9 10.6	-1.1390	0.5563	0.2218	-30	-90
ψ^1 Aquarii	4	1.79	9.1	9 46.8	17 6 49.1	+ 1 23.1	-1.0940	0.5493	0.2337	-23	-90
ψ^2 Aquarii	4 $\frac{1}{2}$	1.80	9.1	10 12.5	7 17.6	+ 1 50.7	-0.5479	0.5490	0.2339	+10	-76
B. A. C. 8274	7	+1.95	+10.7	- 6 59.3	20 53.6	- 9 0.8	-0.5559	0.5428	+0.2445	+11	-76
30 Piscium	4 $\frac{1}{2}$	2.01	10.7	6 37.4	18 3 9.9	- 2 56.8	+0.6146	0.5398	0.2477	+79	- 9
33 Piscium	5	2.03	10.9	6 19.2	4 45.4	- 1 24.5	+0.6993	0.5389	0.2482	+84	- 4
B. A. C. 17	6	2.04	11.1	5 51.3	7 6.2	+ 0 51.7	+0.8112	0.5385	0.2493	+84	+ 2
15 Ceti	6 $\frac{1}{2}$	2.21	13.0	- 1 6.4	20 19.2	-10 20.9	-0.7235	0.5336	0.2520	+ 3	-90
26 Ceti	6	+2.34	+13.4	+ 0 46.8	19 8 42.3	+ 1 38.5	+0.4631	0.5320	+0.2515	+69	-17
29 Ceti	6 $\frac{1}{2}$	2.36	13.7	1 25.3	10 43.2	+ 3 35.5	+0.3054	0.5315	0.2508	+57	-25
33 Ceti	6	2.38	13.9	1 51.9	11 58.1	+ 4 48.1	+0.1612	0.5311	0.2507	+50	-33
35 Ceti	6 $\frac{1}{2}$	2.39	13.6	1 53.6	12 55.3	+ 5 43.5	+0.3705	0.5307	0.2503	+63	-22
f Piscium	5	2.42	14.1	3 2.3	15 28.2	+ 8 11.5	-0.1701	0.5310	0.2497	+32	-50
ν Piscium	4 $\frac{1}{2}$	+2.55	+14.1	+ 4 56.0	20 2 54.5	- 4 43.8	+0.7052	0.5311	+0.2447	+90	- 4
64 Ceti	5 $\frac{1}{2}$	+2.74	+14.4	+ 8 3.5	17 20.6	+ 9 14.8	+0.9324	0.5325	+0.2350	+90	+12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1880.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
ξ^1 Ceti	4 $\frac{1}{2}$	+2.75	+14.5	+ 8 20.0	20 18 7.5	+10 0.2	+0.8303	0.5325	+0.2340	+90	+ 6
ξ Arietis	5 $\frac{1}{2}$	2.83	14.7	10 6.9	23 46.7	- 8 31.4	+0.2870	0.5348	0.2295	+58	-23
B. A. C. 765	6 $\frac{1}{2}$	2.84	14.7	10 4.3	21 0 42.6	- 7 37.3	+0.5462	0.5348	0.2286	+76	-10
31 Arietis	5 $\frac{1}{2}$	2.91	14.8	11 58.5	5 23.3	- 3 5.7	-0.3832	0.5358	0.2236	+21	-59
38 Arietis	5	2.96	14.5	11 59.2	9 21.6	+ 0 45.0	+0.4852	0.5369	0.2198	+71	-12
B. A. C. 1119	6	+3.29	+12.8	+16 10.9	22 10 49.0	+ 1 22.3	+1.2450	0.5405	+0.1834	+90	+44
B. A. C. 1242	6 $\frac{1}{2}$	3.46	11.1	19 53.6	20 41.3	+10 54.7	-0.9274	0.5491	0.1686	-12	-70
ω^1 Tauri	6	3.49	11.5	19 19.2	23 0 21.2	- 9 32.8	+0.2868	0.5505	0.1619	+59	-15
ω^2 Tauri	5 $\frac{1}{2}$	3.54	11.0	20 18.6	4 0.2	- 6 1.3	-0.1858	0.5512	0.1549	+31	-39
NEPTUNE				19 27.2	4 36.3	- 5 26.4	+0.8160	0.5525	0.1538	+90	+14
53 Tauri	6	+3.57	+ 9.9	+20 52.7	4 58.1	- 5 5.3	-0.6438	0.5525	+0.1534	+ 6	-67
B. A. C. 1373	6	3.61	10.3	21 22.6	8 48.6	- 1 22.7	-0.5975	0.5533	0.1460	+ 8	-63
W. iv, 650	6	3.62	9.4	20 26.0	13 25.4	+ 3 4.6	+1.0210	0.5547	0.1363	+90	+30
τ Tauri	4 $\frac{1}{2}$	3.68	9.4	22 45.0	15 9.2	+ 4 44.8	-1.1800	0.5559	0.1331	-35	-67
121 Tauri	6	3.87	4.9	23 58.0	24 14 35.4	+ 3 21.7	+0.0448	0.5609	0.0817	+44	-20
132 Tauri	5 $\frac{1}{2}$	+3.92	+ 3.7	+24 31.9	20 30.4	+ 9 4.2	-0.1203	0.5616	+0.0679	+34	-27
ϵ Geminorum	3 $\frac{1}{2}$	3.96	- 3.5	25 14.5	25 20 27.3	+ 8 10.1	+0.0616	0.5615	+0.0109	+45	-12
ω Geminorum	5 $\frac{1}{2}$	3.94	3.2	24 22.3	26 4 35.0	- 7 59.5	+1.0160	0.5599	-0.0085	+90	+41
A Geminorum	5 $\frac{1}{2}$	3.94	5.3	25 15.6	13 52.7	+ 0 58.8	-0.1311	0.5577	0.0304	+34	-24
κ Geminor. mult.	3 $\frac{1}{2}$	3.87	7.2	24 39.6	23 15.1	+10 1.6	+0.1369	0.5550	0.0518	+49	-12
λ Cancri	5 $\frac{1}{2}$	+3.76	-10.2	+24 21.9	27 15 41.3	+ 1 54.3	-0.6899	0.5475	-0.0872	+ 2	-65
ν^1 Cancri	5 $\frac{1}{2}$	3.74	10.9	24 30.4	19 25.5	+ 5 31.1	-1.1860	0.5454	0.0951	-37	-65
ν^2 Cancri	6	3.72	11.0	24 27.0	20 46.7	+ 6 49.5	-1.2550	0.5444	0.0975	-48	-66
γ Cancri	4 $\frac{1}{2}$	3.64	11.5	21 51.7	28 2 20.5	-11 47.6	+1.0240	0.5416	0.1085	+90	+34
ξ Cancri	5	3.52	13.4	22 29.2	14 45.1	+ 0 12.9	-1.1570	0.5345	0.1311	-32	-68
79 Cancri	6 $\frac{1}{2}$	+3.52	-13.4	+22 26.3	15 13.9	+ 0 40.5	-1.1680	0.5336	-0.1320	-33	-68
B. A. C. 3138	6 $\frac{1}{2}$	3.49	13.6	21 44.0	16 49.7	+ 2 13.5	-0.6025	0.5329	0.1349	+ 8	-63
B. A. C. 3206	6 $\frac{1}{2}$	3.40	13.9	20 15.6	22 17.3	+ 7 30.8	+0.2675	0.5304	0.1440	+57	-15
η Leonis	3 $\frac{1}{2}$	3.14	15.1	17 17.7	29 19 39.9	+ 4 14.1	+0.1275	0.5180	0.1753	+45	-26
42 Leonis	6	3.16	15.4	15 31.6	30 3 10.1	+11 31.0	+0.7366	0.5141	0.1845	+90	+ 5
δ Leonis	5 $\frac{1}{2}$	+2.98	-15.5	+14 41.8	8 34.9	- 7 13.8	+0.6433	0.5112	-0.1905	+86	- 2
κ Leonis	5 $\frac{1}{2}$	2.88	15.9	14 46.3	16 5.6	+ 0 4.0	-0.9040	0.5082	0.1987	- 9	-75
ι Leonis mult.	4	2.64	15.6	11 7.9	31 12 17.2	- 4 18.7	-1.0650	0.5011	0.2162	-19	-79
ω Virginis	6	2.52	14.9	8 44.3	20 15.3	+ 3 26.1	-0.1587	0.4997	0.2216	+33	-24
ξ Virginis	5 $\frac{1}{2}$	+2.48	-15.2	+ 8 52.0	23 59.9	+ 7 4.4	-1.1323	0.4982	-0.2236	-24	-81

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1890.												
Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occul- tation.	
			Washington.		Angle from		Washington.		Angle from			
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.		
			h m	h m	°	°	h m	h m	°	°	h m	
Jan. 3	α Tauri	6	3 49	8 54	50	94	5 12	10 17	276	282	1 23	
6	7 Cancri	6½	4 33	9 26	162	219	4 59	9 52	199	255	0 26	
NEW MOON.												
24	B. A. C. 17	6	1 11	4 54	86	67	2 15	5 58	207	175	1 4	
29	ε Tauri	3½	9 21	12 43	83	28	10 24	13 46	262	209	1 3	
31	3 Geminorum	6½	9 8	12 23	53	356	10 8	13 22	312	254	1 0	
31	6 Geminorum	6½	10 34	13 49	111	53	11 38	14 52	267	211	1 4	
Feb. 2	84 Geminorum	6½	9 22	12 29	182	137	9 40	12 47	205	156	0 18	
9	80 Virginia	6	12 45	15 23	114	127	14 7	16 45	317	307	1 22	
12	ν Scorpii	4½	13 46	16 12	143	172	14 53	17 19	270	286	1 7	
NEW MOON.												
Mar. 6	ν Virginia	4	12 30	13 30	82	65	13 30	14 30	347	312	1 0	
9	94 Virginia	6½	11 11	11 59	155	193	12 11	12 59	270	302	1 0	
NEW MOON.												
29	μ Cancri	6½	8 35	8 5	90	67	10 2	9 32	301	250	1 27	
Apr. 5	88 Virginia	6½	10 28	9 30	103	144	11 37	10 40	324	354	1 9	
5	B. A. C. 4647	6½	15 36	14 38	125	98	16 49	15 51	301	262	1 13	
7	ζ Libræ †	6	10 10	9 5	123	174	11 8	10 2	289	340	0 58	
7	ζ Libræ	5½	11 17	10 12	119	164	12 20	11 15	295	331	1 3	
13	α Capricorni	5	16 46	15 16	45	91	17 41	16 11	291	334	0 55	
NEW MOON.												
22	105 Tauri	6	9 34	7 30	109	52	10 35	8 32	244	189	1 1	
23	1 Geminorum	5	11 19	9 11	128	72	12 7	9 59	239	186	0 48	
25	82 Geminorum	6½	10 52	8 36	110	53	12 3	9 47	281	223	1 11	
May 13	B. A. C. 17	6	18 45	15 16	11	62	19 20	15 51	300	348	0 35	
NEW MOON.												
20	B. A. C. 1801	6	11 54	8 0	32	339	12 24	8 30	329	279	0 30	
June 3	63 Ophiuchi	6½	18 24	13 34	147	140	19 15	14 25	226	207	0 51	
6	γ Capricorni	5½	18 56	13 53	347	14	Star 0° 3 north of	Star 0° 3 north of	D's limb.			
NEW MOON.												
22	ι Leonis	5½	14 18	8 14	28	335	Star 1° 5 north of	Star 1° 5 north of	D's limb.			
26	80 Virginia	6	14 8	7 47	35	94	Star 0° 5 north of	Star 0° 5 north of	D's limb.			
July 1	λ Sagittarii	3	18 26	11 46	139	138	19 22	12 41	228	216	0 56	
2	λ Sagittarii	6	19 3	12 18	40	46	19 59	13 14	308	302	0 56	
2	λ Sagittarii	4½	19 11	12 26	81	85	20 30	13 44	265	253	1 18	
5	π Aquarii multi	5½	21 18	14 21	88	105	22 30	15 33	220	223	1 12	
5	π Aquarii	4	22 46	15 49	44	42	0 0	17 3	270	254	1 14	
11	B. A. C. 1206	6	22 11	14 50	45	98	23 8	15 47	266	330	0 57	
NEW MOON.												
24	95 Virginia	6	15 51	7 40	114	87	17 9	8 58	305	265	1 18	

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emerision below the horizon of Washington.

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emergence below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1890.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Nam ^o .	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
July 24	κ Virginia *	4	^h 20 ^m 16	^h 12 ^m 5	186°	136°	^h 20 ^m 29	^h 12 ^m 18	213°	163°	^h 0 ^m 13
28	63 Ophiuchi	6½	18 53	10 26	141	128	19 47	11 21	228	204	0 54
31	χ Capricorni	5½	16 53	8 14	32	77	17 35	8 57	310	350	0 43
31	ϕ Capricorni	5½	21 6	12 27	340	341	Star 2' 0 north of		D's	limb.	
Aug. 3	33 Piscium †	4½	17 59	9 8	10	61	18 24	9 33	312	2	0 25
3	B. A. C. 17	6	20 14	11 23	36	80	21 14	12 23	272	309	1 0
7	B. A. C. 1119	6	23 34	14 26	48	102	0 43	15 35	256	306	1 9
9	α Tauri †	5½	22 6	12 51	77	125	23 0	13 45	250	302	0 54
NEW MOON.											
23	ω Ophiuchi †	4½	20 51	10 42	75	30	21 50	11 40	301	251	0 58
24	b Ophiuchi var.	5	18 21	8 8	117	104	19 37	9 24	260	232	1 16
24	c Ophiuchi	5	21 14	11 0	43	0	21 58	11 44	320	274	0 44
25	λ Sagittarii	3	17 45	7 28	98	105	19 7	8 50	270	260	1 22
26	λ Sagittarii	4½	20 1	9 40	60	53	21 15	10 53	281	259	1 13
26	λ Sagittarii	6	20 20	9 59	351	340	Star 0' 6 north of		D's	limb.	
29	τ Aquarii mult.	5½	21 20	10 47	113	132	22 7	11 34	189	197	0 47
29	τ Aquarii	4	22 32	11 59	69	71	23 45	13 11	226	211	1 13
Sept. 5	ϵ Tauri	5	23 10	12 8	110	164	23 53	12 52	210	267	0 44
NEW MOON.											
22	ψ Sagittarii	5½	22 32	10 25	55	17	23 32	11 24	282	237	1 0
27	B. A. C. 17	6	20 41	8 13	73	114	21 48	9 21	225	257	1 8
28	29 Ceti	6½	0 6	11 34	348	5	0 36	12 4	300	308	0 30
28	33 Ceti	6	1 47	13 15	359	345	2 31	13 59	289	263	0 44
28	35 Ceti	6½	2 29	13 57	63	38	3 41	15 9	229	190	1 12
Oct. 2	W. iv, 650	6	22 7	9 20	79	131	23 2	10 15	240	295	0 55
NEW MOON.											
14	κ Virginia	4	19 42	6 9	21	330	Star 1' 3 north of		D's	limb.	
23	τ Aquarii	4	20 24	6 15	335	6	Star 1' 2 north of		D's	limb.	
31	5 Geminorum	6½	2 28	11 46	95	153	3 41	12 59	237	293	1 13
Nov. 1	52 Geminorum	6½	7 48	17 1	63	34	9 2	18 16	314	261	1 14
NEW MOON.											
18	B. A. C. 7550	6½	0 24	8 32	143	109	0 50	8 58	185	148	0 26
28	ϵ Geminorum	3½	3 51	11 19	24	82	4 36	12 4	317	11	0 45
29	κ Geminor. mult.	3½	7 11	14 35	82	101	8 39	16 2	297	334	1 28
Dec. 1	B. A. C. 3206	6½	5 24	12 40	116	172	6 44	14 0	272	324	1 20
2	η Leonis †	3½	2 46	9 58	53	101	3 24	10 36	329	19	0 38
NEW MOON.											
15	33 Capricorni	5½	0 15	6 36	95	65	1 9	7 31	215	172	0 55
18	B. A. C. 17	6	0 40	6 50	99	90	1 33	7 43	188	165	0 53
19	26 Ceti	6	2 50	8 56	69	38	4 1	10 7	223	181	1 17
19	29 Ceti	6½	5 31	11 36	70	20	6 31	12 36	235	184	1 0
21	38 Arietis	5	3 3	9 1	82	72	4 19	10 16	215	179	1 15

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emergence below the horizon of Washington.

DOWNE'S TABLE GIVING VALUES OF τ .																												
FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.																												
A	h	m	Lat. 72°			Lat. 66°			Lat. 60°			Lat. 54°			Lat. 48°			Lat. 42°			Lat. 36°							
			x'			x'			x'			x'			x'			x'			x'							
			.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50					
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	7	7	7	7	7	7	7
20	3	3	4	4	5	5	5	6	6	7	7	9	8	9	11	9	10	12	11	12	14	12	14	14	14	14	14	14
30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22	18	22	22	22	22	22	22
40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29	24	29	29	29	29	29	29
50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36	30	36	36	36	36	36	36
1	0	9	10	11	12	14	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42	30	35	42	42	42	42	42
10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48	35	40	48	48	48	48	48
20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54	39	45	54	54	54	54	54
30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59	43	50	59	59	59	59	59
40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64	47	54	64	64	64	64	64
50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68	51	58	68	68	68	68	68
2	0	17	19	22	23	26	30	33	39	36	41	47	42	48	56	48	55	65	54	62	72	54	62	72	72	72	72	72
10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76	57	66	76	76	76	76	76
20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80	60	69	80	80	80	80	80
30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83	63	72	83	83	83	83	83
40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86	65	74	86	86	86	86	86
50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88	68	76	88	88	88	88	88
3	0	23	26	30	31	35	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90	70	79	90	90	90	90	90
10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92	72	81	92	92	92	92	92
20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93	73	82	93	93	93	93	93
30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95	74	83	95	95	95	95	95
40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96	75	84	96	96	96	96	96
50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96	76	85	96	96	96	96	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97	77	86	97	97	97	97
10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97	78	86	97	97	97	97	97
20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97	78	87	97	97	97	97	97
30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97	79	87	97	97	97	97	97
40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97	79	87	97	97	97	97	97
50	30	33	37	39	44	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	96	79	87	96	96	96	96	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95	78	86	95	95	95	95
10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95	78	86	95	95	95	95	95
20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94	78	85	94	94	94	94	94
30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93	77	85	93	93	93	93	93
40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91	76	84	91	91	91	91	91
50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90	75	83	90	90	90	90	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89	74	82	89	89	89	89
10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87	73	80	87	87	87	87	87
20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85	72	79	85	85	85	85	85
30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84	71	78	84	84	84	84	84
40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82	70	76	82	82	82	82	82
50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80	68	74	80	80	80	80	80
7	0	28	31	34	36	40	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78	67	73	78	78	78	78	78
10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76	65	71	76	76	76	76	76
20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74	64	69	74	74	74	74	74
30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	72	62	67	72	72	72	72	72
40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67	60	65	70	60	65	70	70	70	70	70
50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65	58	63	68	58	63	68	68	68	68	68
8	0	24	27	30	31	34	38	41	45	43	47	52	48	52	58	53	57	63	55	60	65	55	60	65	65	65	65	65
10	24	26	29	30	33	37	36	40	44	42	46	50	46	50	47	51	56	52	47	51	56	47	51	56	56	56	56	56
20	23	25	28	29	32	35	35	38	42	40	44	48	44	48	45	49	54	50	45	49	54	45	49	54	54	54	54	54
30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52	46	51	57	49	53	58	49	53	58	58	58	58	58
40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49	44	48	54	46	50	55	46	50	55	55	55	55	55
50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	4													

DOWNES'S TABLE GIVING VALUES OF τ .
FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	m	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
		z'			z'			z'			z'			z'			z'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21	
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32	
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42	
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52	
1	0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69	
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76	
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82	
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88	
50	56	64	76	60	69	82	64	74	87	66	77	89	68	76	92	68	79	93	
2	0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102	
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106	
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109	
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112	
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114	
3	0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117	
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118	
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119	
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120	
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120	
4	0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120	
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120	
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119	
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119	
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118	
5	0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115	
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114	
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113	
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110				
50	80	88	97	84	92	101	87	95	105	89	97	107							
6	0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101										
20	77	84	92	80	88	96	82	91	99										
30	75	82	90	79	86	94													
40	74	81	88	77	84	92													
50	72	79	86																
7	0	71	77	84															

(Concluded from preceding page.)

A	Lat. 72°			Lat. 66°			Lat. 60°			h	Lat. 72°			Lat. 66°			Lat. 60°		
	z'			z'			z'				z'			z'			z'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
b m	m	m	m	m	m	m	m	m	m	b m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
Jan. 1	0.889	39.0	357.4	41.7	July 0	0.534	86.1	169.3	47.6
6	0.802	52.8	352.1	51.4	5	0.677	69.0	174.6	56.9
11	0.661	71.2	347.9	61.2	10	0.822	50.0	181.7	65.3
16	0.455	95.2	342.6	62.4	15	0.937	29.1	191.7	63.4
21	0.215	124.8	336.7	41.5	20	0.994	9.1	216.4	63.8
26	0.039	157.1	328.8	9.2	25	0.991	10.9	345.4	54.6
31	0.021	163.2	204.8	4.8	30	0.954	24.8	5.8	45.6
Feb. 5	0.134	137.0	180.0	26.7	Aug. 4	0.904	36.2	13.3	38.7
10	0.284	115.5	174.1	36.4	9	0.850	45.6	17.9	34.1
15	0.420	99.2	170.3	38.7	14	0.797	53.5	21.1	31.3
20	0.528	86.8	166.9	36.7	19	0.744	60.8	24.5	30.1
25	0.612	76.5	163.6	33.7	24	0.687	68.0	25.3	29.9
Mar. 2	0.680	68.9	160.3	31.4	29	0.625	75.5	26.8	30.6
7	0.737	61.7	157.3	30.0	Sept. 3	0.552	84.0	28.1	32.0
12	0.787	55.0	154.3	29.7	8	0.464	94.1	29.3	33.5
17	0.833	48.2	151.7	30.4	13	0.356	106.7	31.1	33.4
22	0.877	41.1	149.2	32.5	18	0.227	123.1	33.9	28.9
27	0.923	32.2	146.9	36.4	23	0.093	144.5	39.1	15.9
Apr. 1	0.964	21.8	144.0	42.4	28	0.008	169.9	72.9	1.6
6	0.994	8.9	133.7	50.9	Oct. 3	0.047	154.9	195.7	10.3
11	0.995	8.4	347.6	60.7	8	0.226	123.3	205.2	41.9
16	0.942	28.0	336.6	68.2	13	0.467	93.8	208.2	64.3
21	0.825	49.4	337.2	68.3	18	0.681	68.8	209.6	65.3
26	0.670	70.1	339.0	61.1	23	0.827	49.1	210.1	55.4
May 1	0.509	88.9	341.3	50.6	28	0.914	34.0	209.7	44.7
6	0.362	106.0	343.6	39.5	Nov. 2	0.963	22.3	208.2	37.1
11	0.241	121.2	345.8	29.5	7	0.987	13.3	206.0	30.8
16	0.137	136.5	348.0	19.1	12	0.997	5.7	200.5	27.2
21	0.056	152.1	351.6	8.7	17	1.000	1.1	63.4	25.2
26	0.011	168.1	4.6	1.8	22	0.996	6.9	26.9	24.4
31	0.004	172.5	121.8	0.7	27	0.987	13.0	21.1	24.7
June 5	0.038	157.6	149.1	6.0	Dec. 2	0.972	19.2	16.1	26.1
10	0.104	142.4	154.7	14.9	7	0.948	26.2	11.4	28.8
15	0.190	128.3	158.1	23.6	12	0.912	34.6	6.9	33.2
20	0.291	114.8	161.4	31.6	17	0.855	44.8	2.3	39.8
25	0.405	101.0	164.9	39.3	22	0.764	58.0	357.6	48.6
30	0.534	86.1	169.3	47.6	27	0.621	76.0	353.2	57.5
					32	0.518	99.4	348.9	58.4

NOTATION.

k , the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

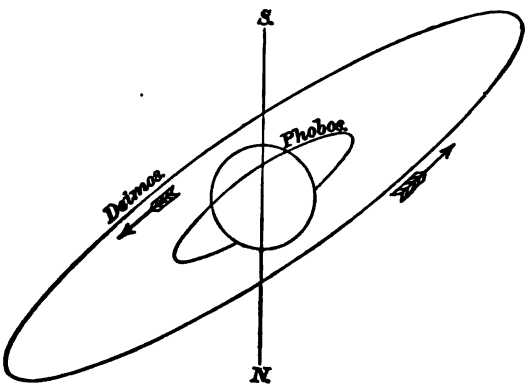
i , the angle between the sun and earth, as seen from the planet.

θ , the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L , the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>
Jan. 1	0.982	15.6	180.2	49.2	July 25	0.739	61.5	20.9	79.6
6	0.985	13.9	176.3	48.7	30	0.722	63.7	21.8	82.8
11	0.988	12.3	172.3	48.3	Aug. 4	0.704	65.9	22.5	86.4
16	0.991	10.7	168.0	48.0	9	0.686	68.2	23.0	90.2
21	0.994	9.1	163.3	47.7	14	0.667	70.4	23.3	94.3
26	0.996	7.5	157.9	47.4	19	0.648	72.7	23.5	99.0
31	0.997	6.0	151.5	47.2	24	0.629	75.1	23.4	104.1
Feb. 5	0.998	4.6	142.7	47.0	29	0.608	77.5	23.2	109.6
10	0.999	3.5	127.3	46.9	Sept. 3	0.587	80.0	22.9	115.9
15	1.000	2.4	96.7	46.8	8	0.565	82.5	22.4	122.7
20	1.000	1.6	47.6	46.8	13	0.542	85.1	21.7	129.9
25	0.999	2.8	17.8	46.8	18	0.518	87.9	20.8	138.2
Mar. 2	0.998	4.7	2.6	46.9	23	0.494	90.7	19.9	147.1
7	0.997	6.4	355.1	47.0	28	0.467	93.7	18.6	156.6
12	0.995	7.9	350.3	47.2	Oct. 2	0.439	97.0	17.7	166.6
17	0.993	9.5	347.3	47.4	7	0.409	100.5	16.6	177.1
22	0.990	11.2	345.1	47.6	12	0.377	104.3	15.5	187.9
27	0.987	13.0	343.9	48.0	17	0.343	108.3	14.4	197.9
Apr. 1	0.984	14.7	343.0	48.4	22	0.306	112.9	13.5	205.9
6	0.980	16.5	342.7	48.9	27	0.266	117.9	12.8	210.5
11	0.975	18.3	342.9	49.4	Nov. 2	0.224	123.6	12.4	209.4
16	0.969	20.2	343.3	49.9	7	0.179	130.0	12.4	197.5
21	0.963	22.1	344.1	50.5	12	0.132	137.3	12.8	172.6
26	0.957	24.0	345.4	51.2	17	0.087	145.7	13.9	132.4
May 1	0.950	25.9	346.7	51.9	22	0.047	155.0	15.4	81.4
6	0.942	27.9	348.4	52.7	24	0.033	159.1	16.6	59.6
11	0.934	29.9	350.3	53.6	26	0.021	163.3	17.4	39.4
16	0.925	31.9	352.5	54.5	28	0.012	167.6	18.9	22.4
21	0.915	33.9	354.8	55.5	30	0.005	172.0	21.6	9.7
26	0.905	36.0	357.2	56.6	Dec. 2	0.001	176.0	29.9	2.3
31	0.894	38.0	359.7	57.9	4	0.000	178.8	159.1	0.2
June 5	0.883	40.1	2.2	59.2	6	0.002	174.5	189.0	4.6
10	0.871	42.2	4.7	60.5	8	0.008	170.0	193.1	14.9
15	0.858	44.3	7.1	62.0	10	0.015	165.7	194.9	29.8
20	0.845	46.4	9.4	63.6	12	0.026	161.4	195.9	48.7
25	0.831	48.5	11.6	65.4	14	0.039	157.3	196.4	69.5
30	0.817	50.6	13.6	67.3	16	0.053	153.2	196.9	91.9
July 5	0.802	52.8	15.5	69.3	18	0.070	149.4	197.2	113.8
10	0.787	55.0	17.1	71.6	20	0.087	145.7	197.4	134.2
15	0.772	57.1	18.6	74.2	22	0.105	142.2	197.3	153.1
20	0.756	59.3	19.8	76.7	27	0.151	134.2	197.0	186.9
25	0.739	61.5	20.9	79.6	32	0.198	127.1	196.1	210.0



APPARENT ORBITS OF THE SATELLITES OF MARS DURING THE OPPOSITION OF 1890, AS SEEN IN AN INVERTING TELESCOPE.

The circle represents the disk of the planet and is on the same scale as the orbits. The mean motions of the satellites are not yet (November, 1886, sufficiently well determined to enable the times of greatest elongation to be very accurately predicted.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

PHOBOS.						DEIMOS.								
May			May			June			May			June		
d	h		d	h		d	h		d	h		d	h	
13	9.5	W.	30	3.3	E.	15	21.0	W.	10	4.7	W.	7	13.8	E.
14	12.3	E.	31	6.0	W.	16	23.8	E.	12	2.1	E.	9	11.2	W.
15	15.1	W.	1	8.8	E.	18	2.6	W.	13	23.5	W.	11	8.6	E.
16	17.9	E.	2	11.6	W.	19	5.3	E.	15	20.9	E.	13	6.0	W.
17	20.7	W.	3	14.4	E.	20	8.1	W.	17	18.3	W.	15	3.4	E.
18	23.4	E.	4	17.2	W.	21	10.9	E.	19	15.7	E.	17	0.8	W.
20	2.2	W.	5	20.0	E.	22	13.7	W.	21	13.1	W.	18	22.2	E.
21	5.0	E.	6	22.7	W.	23	16.5	E.	23	10.5	E.	20	19.6	W.
22	7.8	W.	8	1.5	E.	24	19.3	W.	25	7.9	W.	22	17.1	E.
23	10.6	E.	9	4.3	W.	25	22.1	E.	27	5.3	E.	24	14.5	W.
24	13.4	W.	10	7.1	E.	27	0.9	W.	29	2.7	W.	26	11.9	E.
25	16.1	E.	11	9.9	W.	28	3.6	E.	31	0.2	E.	28	9.4	W.
26	18.9	W.	12	12.6	E.	29	6.4	W.	June 1	21.5	W.	30	6.8	E.
27	21.7	E.	13	15.4	W.	30	9.2	E.	3	18.9	E.	July 2	4.3	W.
29	0.5	W.	14	18.3	E.	July 1	12.0	W.	5	16.4	W.	4	1.7	E.

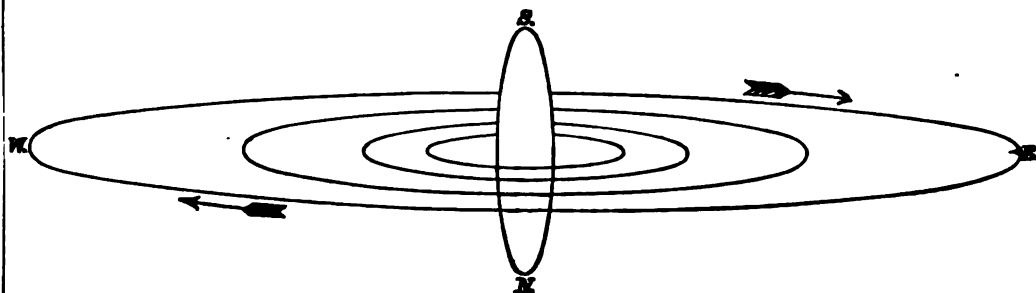
Date.	Position Angle.	Distance.	Date.	Position Angle.	Distance.
May 16 17.9	124.3°	25.1"	May 15 20.9	123.6°	62.4"
June 3 14.4	126.1	26.7	June 7 13.8	125.6	66.6
30 9.2	127.5	24.3	30 6.8	126.6	60.7

For Phobos every seventh eastern and western elongation is given and for Deimos every third; the intermediate ones may be found by adding the periodic time of each satellite.
Periodic time of Phobos, 0^d 7^h 39^m 13^s.937. Periodic time of Deimos, 1^d 6^h 17^m 54^s.377.

APPARENT DISK OF MARS.

January 1,	0.913	May 31,	0.999	September 28,	0.847
31,	0.900	June 30,	0.947	October 28,	0.855
March 2,	0.896	July 30,	0.884	November 27,	0.872
April 1,	0.920	August 29,	0.849	December 27,	0.894
May 1,	0.969				

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



**APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1890,
AS SEEN IN AN INVERTING TELESCOPE.**

(The vertical scale is six times the horizontal one.)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated five times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 458—479, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s	d
I.	1	18	28	35.945	— 1.76966048
II.	3	13	17	53.735	— 3.55409416
III.	7	3	59	35.854	— 7.16638720
IV.	16	18	5	6.928	— 16.75355241

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h m			h m			h m			h m			h m
Feb.	5	10 57.8	April	29	16 8.6	July	21	19 22.0	Oct.	12	22 24.2			
	7	5 28.1	May	1	10 37.2		23	13 48.2		14	16 52.5			
	8	23 58.4		3	5 5.7		25	8 14.0		16	11 21.0			
	10	18 28.7		4	23 34.1		27	2 40.0		18	5 49.5			
	12	12 58.8		6	18 2.4		28	21 6.0		20	0 18.2			
	14	7 29.2		8	12 30.6		30	15 32.0		21	18 46.9			
	16	1 59.4		10	6 58.9	Aug.	1	9 58.0		23	13 15.7			
	17	20 29.6		12	1 27.1		3	4 24.0		25	7 44.4			
	19	14 59.7		13	19 55.2		4	22 50.0		27	2 13.2			
	21	9 29.8		15	14 23.1		6	17 16.1		28	20 42.2			
	23	3 59.9		17	8 51.1		8	11 42.0		30	15 11.3			
	24	22 30.1		19	3 18.9		10	6 8.2	Nov.	1	9 40.3			
	26	17 0.1		20	21 46.9		12	0 34.2		3	4 9.4			
	28	11 30.2		22	16 14.6		13	19 0.4		4	22 38.5			
March	2	6 0.1		24	10 42.2		15	13 26.5		6	17 7.7			
	4	0 30.0		26	5 9.8		17	7 52.8		8	11 37.0			
	5	19 0.0		27	23 37.4		19	2 19.1		10	6 6.4			
	7	13 29.9		29	18 4.9		20	20 45.4		12	0 35.8			
	9	7 59.8		31	12 32.4		22	15 11.7		13	19 5.2			
	11	2 29.7	June	2	6 59.7		24	9 38.1		15	13 34.6			
	12	20 59.4		4	1 27.0		26	4 4.4		17	8 4.1			
	14	15 29.2		5	19 54.0		27	22 31.1		19	2 33.7			
	16	9 58.9		7	14 21.3		29	16 57.6		20	21 3.5			
	18	4 28.7		9	8 48.4		31	11 24.2		22	15 33.1			
	19	22 58.3		11	3 15.4	Sept.	2	5 50.8		24	10 2.9			
	21	17 28.0		12	21 42.3		4	0 17.6		26	4 32.5			
	23	11 57.5		14	16 9.2		5	18 44.4		27	23 2.4			
	25	6 27.1		16	10 35.9		7	13 11.2		29	17 32.1			
	27	0 56.5		18	5 2.7		9	7 38.2	Dec.	1	12 2.0			
	28	19 26.2		19	23 29.5		11	2 5.2		3	6 31.9			
	30	13 55.5		21	17 56.2		12	20 32.3		5	1 1.8			
April	1	8 25.0		23	12 22.7		14	14 59.5		6	19 31.7			
	3	2 54.3		25	6 49.2		16	9 26.7		8	14 1.7			
	4	21 23.7		27	1 15.6		18	3 54.1		10	8 31.8			
	6	15 53.0		28	19 42.2		19	22 21.5		12	3 2.0			
	8	10 22.2		30	14 8.5		21	16 40.0		13	21 32.1			
	10	4 51.3	July	2	8 34.9		23	11 16.5		15	16 2.3			
	11	23 20.5		4	3 1.1		25	5 44.2		17	10 32.3			
	13	17 49.5		5	21 27.4		27	0 11.8		19	5 2.5			
	15	12 18.6		7	15 53.6		28	18 39.5		20	23 32.6			
	17	6 47.5		9	10 19.8		30	13 7.4		22	18 2.9			
	19	1 16.4		11	4 46.0	Oct.	2	7 35.3		24	12 33.2			
	20	19 45.2		12	23 12.1		4	2 3.3		26	7 3.5			
	22	14 14.0		14	17 38.1		5	20 31.3		28	1 33.7			
	24	8 42.7		16	12 4.2		7	14 59.3		29	20 4.0			
	26	3 11.5		18	6 30.1		9	9 27.6		31	14 34.3			
	27	21 40.0		20	0 56.1		11	3 56.0						

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

Feb.	4	h m		April	30	h m		July	24	h m		Oct.	14	h m
	7	2 47.9		May	4	11 29.4			28	15 54.4			17	6 57.3
	11	16 12.6			7	0 45.9			31	5 1.2			21	20 14.8
	14	5 37.2			11	14 2.1		Aug.	4	18 8.0			24	9 32.2
	18	19 1.9			14	3 17.7			7	7 14.9			28	22 51.1
		8 26.3				16 32.8				20 21.8				12 9.7
	21	21 50.8			18	5 47.4			11	9 29.0		Nov.	1	1 29.7
	25	11 14.7			21	19 1.5			14	22 38.4			4	14 49.2
March	1	0 38.6			25	8 15.2			18	11 44.1			8	4 10.4
	4	14 1.8			28	21 28.3			22	0 52.3			11	17 31.0
	8	3 24.9		June	1	10 40.9			25	14 0.7			15	6 53.0
	11	16 47.5			4	23 52.9			29	3 9.9			18	20 14.4
	15	6 9.9			8	13 4.4		Sept.	1	16 19.2			22	9 37.4
	18	19 32.0			12	2 15.2			5	5 29.2			25	22 59.8
	22	8 54.1			15	15 25.7			8	18 39.4			29	12 23.5
	25	22 15.5			19	4 35.6			12	7 50.6		Dec.	3	1 46.5
	29	11 36.7			22	17 45.2			15	21 2.0			6	15 11.1
April	2	0 57.4			26	6 54.2			19	10 14.4			10	4 34.7
	5	14 17.7			29	20 2.9			22	23 27.1			13	17 59.8
	9	3 37.8		July	3	9 11.1			26	12 40.8			17	7 24.2
	12	16 57.5			6	22 18.9			30	1 54.7			20	20 49.9
	16	6 16.9			10	11 26.5		Oct.	3	15 9.6			24	10 14.6
	19	19 35.8			14	0 33.8			7	4 24.7			27	23 40.6
	23	8 54.4			17	13 40.9			10	17 41.0			31	13 5.7
	26	22 12.2			21	2 47.7								

SATELLITE III.

Feb.	3	h m		April	30	h m		July	25	h m		Oct.	18	h m
	10	3 48.8		May	7	7 21.0			1	2 21.0			26	20 40.4
	17	8 16.9			14	11 19.1		Aug.	8	5 37.6				0 39.6
	24	12 44.1			21	15 13.3			15	8 54.2		Nov.	2	4 43.2
March	3	17 9.8			28	19 3.0			22	12 12.4			9	8 51.3
		21 34.8				22 47.6				15 32.4			16	13 2.5
	11	1 57.4		June	5	2 27.9			29	18 55.2			23	17 17.4
	18	6 18.4			12	6 3.6		Sept.	5	22 22.0			30	21 34.6
	25	10 36.4			19	9 34.6			13	1 53.1		Dec.	8	1 54.6
April	1	14 51.6			26	13 2.5			20	5 29.5			15	6 17.1
	8	19 3.9		July	3	16 26.4			27	9 10.1			22	10 41.8
	15	23 13.2			10	19 46.7		Oct.	4	12 55.8			29	15 9.1
	23	3 19.5			17	23 4.6			11	16 45.9				

SATELLITE IV.

Feb.	2	h m		April	27	h m		July	19	h m		Oct.	10	h m
	18	3 13.1		May	14	6 14.8			5	14 39.3			27	18 52.9
		23 52.7			30	0 7.1		Aug.	21	4 50.4				12 43.2
March	7	20 13.7			16	17 4.7			7	19 12.7		Nov.	13	7 25.5
	24	16 9.6		June	3	9 3.9		Sept.	24	10 11.5			30	2 52.1
April	10	11 33.2		July	3	0 11.2				2 2.6		Dec.	16	22 54.5

WASHINGTON MEAN TIME.

The Satellites are invisible from January 1 until February 5, Jupiter being too near the Sun.

FEBRUARY.

[illegible]

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Occ., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



II.



IV.

*Configurations at 18^h 30^m for an Inverting Telescope.*

Day.	West.	East.
5		○ 2 ⁺ 1 ⁺ 3 ⁺ 4 ⁺
6	○ 3 ⁺	2 ⁺ 1 ⁺ ○ 4 ⁺
7		3 ⁺ ○ 2 ⁺ 1 ⁺ 4 ⁺
8	3 ⁺	1 ⁺ ○ 2 ⁺ 4 ⁺
9	3 ⁺ 2 ⁺	○ 1 ⁺ 4 ⁺
10	2 ⁺ 4 ⁺	○ 3 ⁺ 1 ⁺ ●
11	4 ⁺ 1 ⁺	○ 2 ⁺ 3 ⁺
12	4 ⁺	○ 3 ⁺ 1 ⁺ 2 ⁺
13	4 ⁺ 2 ⁺ 1 ⁺	○ 3 ⁺
14	4 ⁺ 3 ⁺	○ 1 ⁺ 2 ⁺ ●
15	4 ⁺ 3 ⁺ 1 ⁺	○ 2 ⁺
16	4 ⁺ 2 ⁺	○ 1 ⁺ 3 ⁺ ●
17	4 ⁺ 2 ⁺ 1 ⁺	○ 3 ⁺
18	○ 1 ⁺	4 ⁺ ○ 2 ⁺ 3 ⁺
19		○ 1 ⁺ 2 ⁺ 4 ⁺ 3 ⁺
20	2 ⁺ 1 ⁺	○ 3 ⁺ 4 ⁺
21	3 ⁺ 2 ⁺	○ 1 ⁺ 4 ⁺
22	3 ⁺ 1 ⁺	○ 2 ⁺ 4 ⁺
23	3 ⁺ 2 ⁺	○ 1 ⁺ 4 ⁺
24	2 ⁺ 1 ⁺	○ 4 ⁺ 3 ⁺ ●
25		○ 1 ⁺ 2 ⁺ 3 ⁺ 4 ⁺
26		○ 1 ⁺ 3 ⁺ 4 ⁺
27	2 ⁺ 1 ⁺	○ 3 ⁺
28	4 ⁺ 3 ⁺ 2 ⁺	○ 1 ⁺

WASHINGTON MEAN TIME.

MARCH.

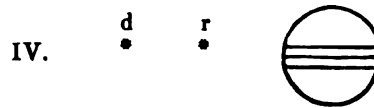
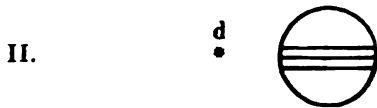
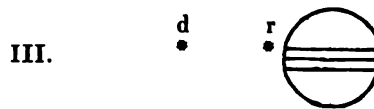
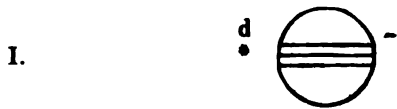
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	2	4		II. Oc. Re.	11	3	44		III. Oc. Re.	21	18	38		I. Oc. Re.					
	6	52		I. Sh. In.		13	27	47.1	II. Ec. Dis.		18	40		III. Tr. In.					
	7	42		I. Tr. In.		18	13		II. *Oc. Re.		22	15		III. Tr. Eg.					
	9	11		I. Sh. Eg.		21	42		I. Sh. In.	22	5	19	44.0	II. Ec. Dis.					
	10	1		I. Tr. Eg.		22	41		I. Tr. In.		10	20		II. Oc. Re.					
2	4	1	25.9	I. Ec. Dis.	12	0	1		I. Sh. Eg.		12	32		I. Sh. In.					
	7	10		I. Oc. Re.		1	1		I. Tr. Eg.		13	38		I. Tr. In.					
	15	42		II. *Sh. In.		18	52	12.2	I. Ec. Dis.		14	51		I. Sh. Eg.					
	17	24		II. *Tr. In.		22	9		I. Oc. Re.		15	58		I. *Tr. Eg.					
	18	32		II. Sh. Eg.	13	7	36		II. Sh. In.	23	9	42	58.8	I. Ec. Dis.					
	20	16		II. Tr. Eg.		9	35		II. Tr. In.		13	7		I. Oc. Re.					
3	1	20		I. Sh. In.		10	26		II. Sh. Eg.		23	30		II. Sh. In.					
	2	11		I. Tr. In.		12	27		II. Tr. Eg.	24	1	43		II. Tr. In.					
	3	39		I. Sh. Eg.		16	11		I. *Sh. In.		2	20		II. Sh. Eg.					
	4	31		I. Tr. Eg.		17	10		I. *Tr. In.		3	35	39.1	IV. Ec. Dis.					
	16	22	5.9	III. *Ec. Dis.		18	30		I. Sh. Eg.		4	35		II. Tr. Eg.					
	19	41	13.1	III. Ec. Re.		19	30		I. Tr. Eg.		7	0		I. Sh. In.					
	19	49		III. Oc. Dis.	14	10	17		III. Sh. In.		7	37	45.1	IV. Ec. Re.					
	22	29	58.8	I. Ec. Dis.		13	20	43.3	I. Ec. Dis.		8	8		I. Tr. In.					
	23	21		III. Oc. Re.		13	46		III. Sh. Eg.		9	19		I. Sh. Eg.					
4	1	40		I. Oc. Re.		14	22		III. Tr. In.		10	28		I. Tr. Eg.					
	10	52	56.7	II. Ec. Dis.		16	39		I. *Oc. Re.		13	56		IV. Oc. Dis.					
	15	27		II. Oc. Re.	15	17	56	12.1	III. *Tr. Eg.	25	18	23		IV. Oc. Re.					
	19	48		I. Sh. In.		2	45		II. Ec. Dis.		4	11	28.3	I. Ec. Dis.					
	20	41		I. Tr. In.		7	36		II. Oc. Re.		4	19	9.4	III. Ec. Dis.					
	22	7		I. Sh. Eg.		10	39		I. Sh. In.		6	37		I. Oc. Re.					
	23	1		I. Tr. Eg.		11	40		I. Tr. In.		7	40	25.2	III. Ec. Re.					
5	16	58	20.6	I. Ec. Dis.		12	58		I. Sh. Eg.		8	48		III. Oc. Dis.					
	20	10		I. Oc. Re.		14	0		I. Tr. Eg.		12	24		III. Oc. Re.					
6	5	0		II. Sh. In.		19	2		IV. Sh. In.		18	36	53.8	II. Ec. Dis.					
	6	48		II. Tr. In.	16	23	10		IV. Sh. Eg.	26	23	42		II. Oc. Re.					
	7	50		II. Sh. Eg.		4	31		IV. Tr. In.		1	29		I. Sh. In.					
	9	40		II. Tr. Eg.		7	49	8.8	I. Ec. Dis.		2	38		I. Tr. In.					
	14	17		I. Sh. In.		8	54		IV. Tr. Eg.		3	48		I. Sh. Eg.					
	15	11		I. Tr. In.		11	9		I. Oc. Re.		4	58		I. Tr. Eg.					
	16	36		I. *Sh. Eg.		20	54		II. Sh. In.		22	39	51.8	I. Ec. Dis.					
	17	31		I. *Tr. Eg.		22	58		II. Tr. In.	27	1	6		I. Oc. Re.					
7	6	18		III. Sh. In.		23	44		II. Sh. Eg.		12	43		II. Sh. In.					
	9	34	18.6	IV. Ec. Dis.	17	1	50		II. Tr. Eg.		15	5		II. Tr. In.					
	9	46		III. Sh. Eg.		5	8		I. Sh. In.		15	38		II. Sh. Eg.					
	10	0		III. Tr. In.		6	9		I. Tr. In.		17	57		II. *Tr. Eg.					
	11	26	52.2	I. Ec. Dis.		7	27		I. Sh. Eg.		19	57		I. Sh. In.					
	13	30	43.2	IV. Ec. Re.	18	8	29		I. Tr. Eg.		21	7		I. Tr. In.					
	13	33		III. Tr. Eg.		0	20	26.0	III. Ec. Dis.		22	16		I. Sh. Eg.					
	14	40		I. Oc. Re.		2	17	38.4	I. Ec. Dis.		23	27		I. Tr. Eg.					
	18	5		IV. *Oc. Dis.		3	40	50.0	III. Ec. Re.	28	17	8	22.7	I. *Ec. Dis.					
	22	22		IV. Oc. Re.		4	31		III. Oc. Dis.		18	14		III. *Sh. In.					
8	0	10	29.3	II. Ec. Dis.		5	39		I. Oc. Re.		20	36		I. Oc. Re.					
	4	50		II. Oc. Re.		8	6		III. Oc. Re.		21	45		III. Sh. Eg.					
	8	45		I. Sh. In.		16	2	25.7	II. *Ec. Dis.	29	22	56		III. Tr. In.					
	9	41		I. Tr. In.		20	58		II. Oc. Re.		2	32		III. Tr. Eg.					
	11	4		I. Sh. Eg.		23	36		I. Sh. In.		7	54	5.7	II. Ec. Dis.					
	12	1		I. Tr. Eg.	19	0	39		I. Tr. In.		13	3		II. Oc. Re.					
9	5	55	18.0	I. Ec. Dis.		1	55		I. Sh. Eg.		14	25		I. Sh. In.					
	9	10		I. Oc. Re.		2	59		I. Tr. Eg.		15	36		I. Tr. In.					
	18	18		II. *Sh. In.		20	46	2.4	I. Ec. Dis.		16	44		I. *Sh. Eg.					
	20	12		II. Tr. In.	20	0	8		I. Oc. Re.		17	56		I. *Tr. Eg.					
	21	8		II. Sh. Eg.		10	12		II. Sh. In.	30	11	36	47.8	I. Ec. Dis.					
	23	4		II. Tr. Eg.		12	21		II. Tr. In.		15	5		I. Oc. Re.					
10	3	14		I. Sh. In.		13	2		II. Sh. Eg.	31	2	6		II. Sh. In.					
	5	33		I. Tr. In.		15	13		II. Tr. Eg.		4	27		II. Tr. In.					
	6	31		I. Sh. Eg.		18	4		I. *Sh. In.		4	56		II. Sh. Eg.					
	20	21	6.9	I. Tr. Eg.		19	8		I. Tr. In.		7	19		II. Tr. Eg.					
	23	40	57.9	III. Ec. Dis.		20	23		I. Sh. Eg.		8	54		I. Sh. In.					
11	0	11		III. Ec. Re.		21	28		I. Tr. Eg.		10	6		I. Tr. In.					
	0	23	47.8	III. Oc. Dis.	21	14	15		III. Sh. In.		11	13		I. Sh. Eg.					
	3	40		I. Ec. Dis.		15	14	33.4	I. Ec. Dis.		12	26		I. Tr. Eg.					
				I. Oc. Re.		17	45		III. *Sh. Eg.										

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.*Configurations at 17^h for an Inverting Telescope.*

Day.	West.				East.			
1		4 [•]	3 [•]	1 [•]	○	2 [•]		
2		4 [•]		3 [•]	○ 2 [•]	1 [•]		
3		4 [•]		2 [•]	○ 1 [•]	3 [•]		
4		4 [•]			○ 2 [•]	1 [•]	3 [•]	
5			4 [•]		○ 1 [•]	2 [•]	3 [•]	
6	○ 1 [•]			4 [•]	○ 2 [•]	3 [•]		
7				3 [•]	○ 4 [•]	1 [•]		
8			3 [•]	1 [•]	○	2 [•]	4 [•]	
9			3 [•]		○ 2 [•]	1 [•]	4 [•]	
10				2 [•]	○ 1 [•]	3 [•]		4 [•]
11					○ 1 [•]	3 [•]	4 [•]	2 [•] ●
12				1 [•]		2 [•]	3 [•]	4 [•]
13				2 [•]	○ 1 [•]	3 [•]	4 [•]	
14	○ 3 [•]			2 [•]	○ 1 [•]	4 [•]		1 [•] ●
15			3 [•]	1 [•]	○	4 [•]	2 [•]	
16			3 [•]	4 [•]	○	1 [•]		
17			4 [•]	2 [•]	○			
18		4 [•]			○ 2 [•]	1 [•]		
19		4 [•]		1 [•]	○	2 [•]	3 [•]	
20		4 [•]			○ 2 [•]	1 [•]	3 [•]	
21		4 [•]		2 [•]	○ 3 [•]			1 [•] ●
22			4 [•]	3 [•]	○ 1 [•]	2 [•]		
23			3 [•]	4 [•]	○	1 [•]	2 [•]	
24				1 [•]	○			4 [•] ●
25				2 [•]	○	3 [•]	1 [•]	4 [•]
26				1 [•]	○	2 [•]	3 [•]	4 [•]
27	○ 2 [•]				○ 1 [•]	3 [•]		4 [•]
28			2 [•]	1 [•]	○ 3 [•]			4 [•]
29	○ 1 [•]		3 [•]		○ 2 [•]			4 [•]
30			3 [•]		○ 1 [•]	2 [•]		4 [•]
31			3 [•]	2 [•]	○ 1 [•]		4 [•]	

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	6	5	17.1	I. Ec. Dis.	10	20	51		II. Sh. Eg.	21	9	54		II. Sh. In.					
	8	17	44.9	III. Ec. Dis.		23	22		II. Tr. Eg.		12	31		II. Tr. In.					
	9	35		I. Oc. Re.		23	44		I. Sh. In.		12	45		II. Sh. Eg.					
	11	39	41.3	III. Ec. Re.	11	1	0		I. Tr. In.		14	34		I. Sh. In.					
	13	3		III. Oc. Dis.		2	4		I. Sh. Eg.		15	24		II. * Tr. Eg.					
	13	6		IV. Sh. In.		3	20		I. Tr. Eg.		15	54		I. * Tr. In.					
	16	40		III. * Oc. Re.		20	55	59.1	I. Ec. Dis.		16	54		I. * Sh. Eg.					
	17	20		IV. * Sh. Eg.	12	0	31		I. Oc. Re.		18	14		I. Tr. Eg.					
	21	11	11.6	II. Ec. Dis.		2	12		III. Sh. In.	22	11	46	42.5	I. Ec. Dis.					
2	0	10		IV. Tr. In.		5	44		III. Sh. Eg.		15	24		I. * Oc. Re.					
	2	24		II. Oc. Re.		7	20		III. Tr. In.		20	14	39.2	III. Ec. Dis.					
	3	22		I. Sh. In.		10	58		III. Tr. Eg.		23	38	31.6	III. Ec. Re.					
	4	35		I. Tr. In.		13	2	22.1	II. Ec. Dis.	23	1	30		III. Oc. Dis.					
	4	41		IV. Tr. Eg.		18	12		I. Sh. In.		4	53	15.5	II. Ec. Dis.					
	5	41		I. Sh. Eg.		18	24		II. Oc. Re.		5	9		III. Oc. Re.					
	6	55		I. Tr. Eg.		19	29		I. Tr. In.		9	2		I. Sh. In.					
3	0	33	40.5	I. Ec. Dis.		20	32		I. Sh. Eg.		10	21		II. Oc. Re.					
	4	4		I. Oc. Re.		21	49		I. Tr. Eg.		10	22		I. Tr. In.					
	15	24		II. * Sh. In.	13	15	24	24.0	I. * Ec. Dis.		11	22		I. Sh. Eg.					
	17	48		II. Tr. In.		19	0		I. Oc. Re.		12	42		I. Tr. Eg.					
	18	14		II. Sh. Eg.	14	7	18		II. Sh. In.	24	6	15	5.6	I. Ec. Dis.					
	20	40		II. Tr. Eg.		9	51		II. Tr. In.		9	53		I. Oc. Re.					
	21	50		I. Sh. In.		10	9		II. Sh. Eg.		23	13		II. Sh. In.					
	23	4		I. Tr. In.		12	40		I. Sh. In.	25	1	51		II. Tr. In.					
4	0	9		I. Sh. Eg.		12	44		II. Tr. Eg.		2	4		II. Sh. Eg.					
	1	24		I. Tr. Eg.		13	58		I. Tr. In.		3	30		I. Sh. In.					
	19	2	11.4	I. Ec. Dis.		15	0		I. * Sh. Eg.		4	44		II. Tr. Eg.					
	22	13		III. Sh. In.		16	18		I. * Tr. Eg.		4	51		I. Tr. In.					
	22	34		I. Oc. Re.	15	9	52	53.5	I. Ec. Dis.		5	50		I. Sh. Eg.					
5	1	45		III. Sh. Eg.		13	29		I. Oc. Re.	26	7	11		I. Tr. Eg.					
	3	10		III. Tr. In.		16	15	12.7	III. * Ec. Dis.		4	43	36.5	I. Ec. Dis.					
	6	47		III. Tr. Eg.		19	38	27.5	III. Ec. Re.		4	22		I. Oc. Re.					
	10	28	18.0	II. Ec. Dis.		21	24		III. Oc. Dis.		10	9		III. Sh. In.					
	15	44		II. * Oc. Re.	16	1	2		III. Oc. Re.		13	43		III. Sh. Eg.					
	16	19		I. * Sh. In.		2	19	21.3	II. Ec. Dis.		15	30		III. * Tr. In.					
	17	33		I. Tr. In.		7	9		I. Sh. In.		15	39	32.7	IV. * Ec. Dis.					
	18	39		I. Sh. Eg.		7	43		II. Oc. Re.		18	10	9.5	II. Ec. Dis.					
	19	53		I. Tr. Eg.		8	27		I. Tr. In.		19	9		III. Tr. Eg.					
6	13	30	36.1	I. Ec. Dis.		9	29		I. Sh. Eg.		19	51	56.1	IV. Ec. Re.					
	17	3		I. Oc. Re.		10	47		I. Tr. Eg.		21	59		I. Sh. In.					
7	4	42		II. Sh. In.	17	4	21	16.7	I. Ec. Dis.		23	20		I. Tr. In.					
	7	9		II. Tr. In.		7	59		I. Oc. Re.	27	0	19		II. Oc. Re.					
	7	32		II. Sh. Eg.		20	36		II. Sh. In.		1	40		I. Sh. Eg.					
	10	1		II. Tr. Eg.		23	11		II. Tr. In.		3	55		I. Tr. Eg.					
	10	47		I. Sh. In.		23	27		II. Sh. Eg.		8	35		IV. Oc. Dis.					
	12	2		I. Tr. In.	18	1	37		I. Sh. In.		19	12	1.6	IV. Oc. Re.					
	13	7		I. Sh. Eg.		2	4		II. Tr. Eg.		19	12		I. Ec. Dis.					
	14	22		I. Tr. Eg.		2	56		I. Tr. In.		22	50		I. Oc. Re.					
8	7	59	5.4	I. Ec. Dis.		3	57		I. Sh. Eg.	28	12	31		II. Sh. In.					
	11	32		I. Oc. Re.		5	16		I. Tr. Eg.		15	9		II. * Tr. In.					
	12	16	24.7	III. Ec. Dis.		7	11		IV. Sh. In.		15	22		II. * Sh. Eg.					
	15	39	0.5	III. * Ec. Re.		11	30		IV. Sh. Eg.		16	27		I. * Sh. In.					
	17	15		III. * Oc. Dis.		19	12		IV. Tr. In.		17	48		I. Tr. In.					
	20	52		III. Oc. Re.		22	49	47.5	I. Ec. Dis.		18	2		II. Tr. Eg.					
	23	45	20.6	II. Ec. Dis.		23	50		IV. Tr. Eg.		18	47		I. Sh. Eg.					
9	5	4		II. Oc. Re.	19	2	26		I. Oc. Re.		20	8		I. Tr. Eg.					
	5	15		I. Sh. In.		6	11		III. Sh. In.	29	13	40	32.1	I. Ec. Dis.					
	6	31		I. Tr. In.		9	44		III. Sh. Eg.		17	19		I. * Oc. Re.					
	7	35		I. Sh. Eg.		11	26		III. Tr. In.	30	0	13	42.4	III. Ec. Dis.					
	8	51		I. Tr. Eg.		15	6		III. * Tr. Eg.		3	38	10.8	III. Ec. Re.					
	21	37	45.5	IV. Ec. Dis.		15	36	18.7	II. Ec. Dis.		5	31		III. Oc. Dis.					
10	1	45	10.9	IV. Ec. Re.		20	5		I. Sh. In.		7	27	4.0	II. Ec. Dis.					
	2	27	28.3	I. Ec. Dis.		21	2		II. Oc. Re.		9	11		III. Oc. Re.					
	6	1		I. Oc. Re.		21	25		I. Tr. In.		10	55		I. Sh. In.					
	9	16		IV. Oc. Dis.		22	25		I. Sh. Eg.		12	16		I. Tr. In.					
	13	50		IV. Oc. Re.		23	45		I. Tr. Eg.		12	56		II. Oc. Re.					
	18	0		II. Sh. In.	20	17	18	12.6	I. * Ec. Dis.		13	15		I. Sh. Eg.					
	20	30		II. Tr. In.		20	55		I. Oc. Re.		14	36		I. Tr. Eg.					

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

d

•



III.

d

•

r

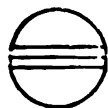
•



II.

d

•



IV.

d

•

r

•

*Configurations at 16^h for an Inverting Telescope.*

Day.	West.				East.			
1			2	○	4	1		3 ●
2			1	○		2	3	
3		4		○	2	1	3	
4	4		2	○		3		
5	4		3	○	2	1		
6	4	3		○		2		1 ●
7	4	3	2	○				
8	4	2	3	○	1			
9		4	1	○		2	3	
10				○	4	2	1	3
11		2	1	○		3	4	
12			3	○	1		4	2 ●
13		3	1	○		2		4
14	○ 1		3	○				4
15		2	3	○	1			4
16			1	○		2	3	4
17				○	2	1	4	3
18		2	1	○	4		3	
19		4	2	○	1			
20		4	3	○		2		
21	○ 1	4	3	○				
22		4	2	○	1			
23		4		○	2	3		
24		4		○	1	2	3	
25		4	2	○		3		
26	○ 3		4	○	1			
27			3	○	4	2		
28	○ 2		3	○	1		4	
29			2	○			4	1 ●
30			1	○	2	3		4

WASHINGTON MEAN TIME.

MAY.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	8	8	55.5	I. Ec. Dis.	11	4	45		II. Oc. Re.	21	18	56		I. Sh. Eg.	21	18	56		I. Sh. Eg.
	11	47		I. Oc. Re.		5	25		I. Tr. Eg.		19	21		IV. Sh. In.		19	21		IV. Sh. In.
2	1	49		II. Sh. In.	12	22	59	44.6	I. Ec. Dis.		20	13		I. Tr. Eg.		20	13		I. Tr. Eg.
	4	27		II. Tr. In.	19	2	37		I. Oc. Re.		20	29		II. Oc. Re.		20	29		II. Oc. Re.
	4	40		II. Sh. Eg.		17	44		II. Sh. In.		20	53		III. Oc. Re.		20	53		III. Oc. Re.
	5	24		I. Sh. In.		20	14		I. Sh. In.		23	49		IV. Sh. Eg.		23	49		IV. Sh. Eg.
	6	44		I. Tr. In.		20	20		II. Tr. In.	22	6	54		IV. Tr. In.		23	49		IV. Tr. In.
	7	21		II. Tr. Eg.		20	36		II. Sh. Eg.	23	11	41		IV. Tr. Eg.		23	49		IV. Tr. Eg.
	7	44		I. Sh. Eg.		21	33		I. Tr. In.		13	50	35.7	I. Ec. Dis.		23	49		I. Ec. Dis.
	9	4		I. Tr. Eg.		22	34		I. Sh. Eg.		17	25		I. Oc. Re.		23	49		I. Oc. Re.
3	2	37	26.7	I. Ec. Dis.		23	14		II. Tr. Eg.	23	9	39		II. Sh. In.		23	49		II. Sh. In.
	6	16		I. Oc. Re.		23	53		I. Tr. Eg.		11	4		I. Sh. In.		23	49		I. Sh. In.
	14	8		III. Sh. In.	13	9	41	45.0	IV. Ec. Dis.		12	7		II. Tr. In.		23	49		II. Tr. In.
	17	42		III. Sh. Eg.		13	58	42.4	IV. Ec. Re.		12	20		I. Tr. In.		23	49		I. Tr. In.
	19	29		III. Tr. In.		17	28	15.9	I. Ec. Dis.		12	31		II. Sh. Eg.		23	49		II. Sh. Eg.
	20	43	55.7	II. Ec. Dis.		21	5		I. Oc. Re.		13	24		I. Sh. Eg.		23	49		I. Sh. Eg.
	23	9		III. Tr. Eg.		21	44		IV. Oc. Dis.		14	40		I. Tr. Eg.		23	49		I. Tr. Eg.
	23	52		I. Sh. In.	14	2	29		IV. Oc. Re.		15	1		II. Tr. Eg.		23	49		II. Tr. Eg.
4	1	12		I. Tr. In.		8	11	55.9	III. Ec. Dis.	24	8	19	8.6	I. Ec. Dis.		23	49		I. Ec. Dis.
	2	12		I. Sh. Eg.		11	37	33.7	III. Ec. Re.		11	52		I. Oc. Re.		23	49		I. Oc. Re.
	2	13		II. Oc. Re.		12	34	30.4	II. Ec. Dis.	25	2	5		III. Sh. In.		23	49		III. Sh. In.
	3	32		I. Tr. Eg.		13	23		III. Oc. Dis.		4	25	1.2	II. Ec. Dis.		23	49		II. Ec. Dis.
	21	5	52.2	I. Ec. Dis.		14	42		I. Sh. In.		5	32		I. Sh. In.		23	49		I. Sh. In.
5	0	44		I. Oc. Re.		16	1		I. Tr. In.		5	40		III. Sh. Eg.		23	49		III. Sh. Eg.
	1	15		IV. Sh. In.		17	2		I. Sh. Eg.		6	47		I. Tr. In.		23	49		I. Tr. In.
	5	39		IV. Sh. Eg.		17	3		III. Oc. Re.		7	4		III. Tr. In.		23	49		III. Tr. In.
	13	29		IV. Tr. In.		18	0		II. Oc. Re.		7	52		I. Sh. Eg.		23	49		I. Sh. Eg.
	15	7		II. Sh. In.		18	21		I. Tr. Eg.		9	7		I. Tr. Eg.		23	49		I. Tr. Eg.
	17	45		II. Tr. In.	15	11	56	40.0	I. Ec. Dis.		9	42		II. Oc. Re.		23	49		II. Oc. Re.
	17	58		II. Sh. Eg.		15	33		I. Oc. Re.		10	45		III. Tr. Eg.		23	49		III. Tr. Eg.
	18	12		IV. Tr. Eg.		16	7	2	II. Sh. In.	26	2	47	35.9	I. Ec. Dis.		23	49		I. Ec. Dis.
	18	21		I. Sh. In.		9	11		I. Sh. In.		6	20		I. Oc. Re.		23	49		I. Oc. Re.
	19	41		I. Tr. In.		9	36		II. Tr. In.		22	57		II. Sh. In.		23	49		II. Sh. In.
	20	39		II. Tr. Eg.		9	54		II. Sh. Eg.	27	0	1		I. Sh. In.		23	49		I. Sh. In.
	20	41		I. Sh. Eg.		10	29		I. Tr. In.		1	14		I. Tr. In.		23	49		I. Tr. In.
	22	1		I. Tr. Eg.		11	31		I. Sh. Eg.		1	22		II. Tr. In.		23	49		II. Tr. In.
6	15	34	23.0	I. Ec. Dis.		12	30		II. Tr. Eg.		1	49		II. Sh. Eg.		23	49		II. Sh. Eg.
	19	13		I. Oc. Re.		12	49		I. Tr. Eg.		2	21		I. Sh. Eg.		23	49		I. Sh. Eg.
7	4	13	5.0	III. Ec. Dis.	17	6	25	12.4	I. Ec. Dis.		3	34		I. Tr. Eg.		23	49		I. Tr. Eg.
	7	38	8.2	III. Ec. Re.		10	1		I. Oc. Re.		4	17		II. Tr. Eg.		23	49		II. Tr. Eg.
	9	29		III. Oc. Dis.		22	4		III. Sh. In.		21	16	9.0	I. Ec. Dis.		23	49		I. Ec. Dis.
	10	0	48.6	II. Ec. Dis.	18	1	39		III. Sh. Eg.	28	0	47		I. Oc. Re.		23	49		I. Oc. Re.
	12	49		I. Sh. In.		1	51	19.6	II. Ec. Dis.		16	9	40.8	III. Ec. Dis.		23	49		III. Ec. Dis.
	13	9		III. Oc. Re.		3	16		III. Tr. In.		17	41	52.4	II. Ec. Dis.		23	49		II. Ec. Dis.
	14	9		I. Tr. In.		3	39		I. Sh. In.		18	29		I. Sh. In.		23	49		I. Sh. In.
	15	10		I. Sh. Eg.		4	57		I. Tr. In.		19	36	23.6	III. Ec. Re.		23	49		III. Ec. Re.
	15	29		II. Oc. Re.		5	59		I. Sh. Eg.		19	41		I. Tr. In.		23	49		I. Tr. In.
	16	29		I. Tr. Eg.		6	56		III. Tr. Eg.		20	49		I. Sh. Eg.		23	49		I. Sh. Eg.
8	10	2	47.0	I. Ec. Dis.		7	15		II. Oc. Re.		20	52		III. Oc. Dis.		23	49		III. Oc. Dis.
	13	41		I. Oc. Re.		7	17		I. Tr. Eg.		22	1		I. Tr. Eg.		23	49		I. Tr. Eg.
9	4	26		II. Sh. In.	19	0	53	36.8	I. Ec. Dis.		22	56		II. Oc. Re.		23	49		II. Oc. Re.
	7	3		II. Tr. In.		4	30		I. Oc. Re.	29	0	38		III. Oc. Re.		23	49		III. Oc. Re.
	7	17		II. Sh. Eg.		20	20		II. Sh. In.		15	44	34.4	I. Ec. Dis.		23	49		I. Ec. Dis.
	7	17		I. Sh. In.		22	7		I. Sh. In.		19	15		I. Oc. Re.		23	49		I. Oc. Re.
	8	37		I. Tr. In.		22	52		II. Tr. In.	30	3	45	0.8	IV. Ec. Dis.		23	49		IV. Ec. Dis.
	9	37		I. Sh. Eg.		23	12		II. Sh. Eg.		12	16		IV. Ec. Re.		23	49		IV. Ec. Re.
	9	57		II. Tr. Eg.		23	25		I. Tr. In.		12	16		II. Sh. In.		23	49		II. Sh. In.
	10	57		I. Tr. Eg.	20	0	27		I. Sh. Eg.		12	57		I. Sh. In.		23	49		I. Sh. In.
10	4	31	18.6	I. Ec. Dis.		1	44		I. Tr. Eg.		14	9		I. Tr. In.		23	49		I. Tr. In.
	8	9		I. Oc. Re.		1	46		II. Tr. Eg.		14	36		II. Tr. In.		23	49		II. Tr. In.
	18	6		III. Sh. In.		19	22	11.0	I. Ec. Dis.		14	41		IV. Oc. Dis.		23	49		IV. Oc. Dis.
	21	41		III. Sh. Eg.		22	57		I. Oc. Re.		15	9		II. Sh. Eg.		23	49		II. Sh. Eg.
	23	17	38.8	II. Ec. Dis.	21	12	10	42.9	III. Ec. Dis.		15	17		I. Sh. Eg.		23	49		I. Sh. Eg.
	23	25		III. Tr. In.		15	8	11.2	II. Ec. Dis.		16	29		I. Tr. Eg.		23	49		I. Tr. Eg.
11	1	46		I. Sh. In.		15	36	54.1	III. Ec. Re.		17	31		II. Tr. Eg.		23	49		II. Tr. Eg.
	3	5		III. Tr. Eg.		16	36		I. Sh. In.		19	28		IV. Oc. Re.		23	49		IV. Oc. Re.
	3	5		I. Tr. In.		17	13		III. Oc. Dis.	31	10	13	8.1	I. Ec. Dis.		23	49		I. Ec. Dis.
	4	6		I. Sh. Eg.		17	53		I. Tr. In.		13	42		I. Oc. Re.		23	49		I. Oc. Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipses.

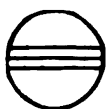
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

d
•

III.

d
•r
•

II.

d
•

IV.

d
•r
•*Configurations at 14^h 30^m for an Inverting Telescope.*

Day.	West.				East.			
1					○	·1	·2	·3 4
2				1 ¹	○		·3	4
3				2	○	·3	·1	4
4				3	○		·2 4	
5	○ 4			3	○	·1		
6				4	○			
7	○ 1			4	○	·3		·2 ●
8				4	○	·1	·2	·3
9				4	○		·3	
10				4	○		·1	
11				4	○		·2	
12				4	○		·1	
13				4	○			
14				4	○	·1	·4	·3 ●
15				4	○		·2	·3
16				4	○		·3	·4
17				4	○	·1	·3	·4
18				4	○	·2		4
19				4	○	·1		4
20				4	○			4
21				4	○	·1	·4	
22				4	○			
23	○ 1	○ 2		4	○			·3
24				4	○	·1	·3	
25				4	○	·2		
26				4	○	·1	·2	
27				4	○			
28				4	○	·1		
29				4	○			
30	○ 1			4	○	·2		·3
31				4	○	·1	·4	·3

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	6	58	43.4	III. Sh. In.	10	7	11		I. Tr. Eg.	20	20	7		II. Sh. In.	20	20	7		II. Sh. In.
	7	26		II. Ec. Dis.		9	11		II. Tr. Eg.		20	58		I. Sh. Eg.		21	52		I. Sh. Eg.
	8	36		I. Sh. In.	11	1	4	15.4	I. Ec. Dis.		21	52		I. Tr. Eg.		21	52		II. Tr. In.
	9	40		I. Tr. In.		4	25		I. Oc. Re.		21	52		II. Tr. In.		23	0		II. Sh. Eg.
				III. Sh. Eg.		22	16		I. Sh. In.		23	0							
	9	46		I. Sh. Eg.		22	49	22.4	II. Ec. Dis.	21	0	46		II. Tr. Eg.		15	55	30.5	II. Tr. Eg.
	10	47		III. *Tr. In.		23	18		I. Tr. In.		15	55	30.5	I. Ec. Dis.		19	6		I. Oc. Re.
	10	56		I. *Tr. Eg.	19	0	8	43.2	III. Ec. Dis.		19	6		I. *Sh. In.		13	58		I. *Tr. In.
	12	8		II. *Oc. Re.		0	36		I. Sh. Eg.		13	58							
	14	28		III. *Tr. Eg.		1	38		I. Tr. Eg.										
2	4	41	36.1	I. Ec. Dis.		3	36	26.0	III. Ec. Re.		14	40	14.7	II. *Ec. Dis.		14	40	14.7	II. *Ec. Dis.
	8	10		I. Oc. Re.		3	43		II. Oc. Re.		15	26		I. Sh. In.		16	18		I. Sh. In.
3	1	34		II. Sh. In.		4	13		III. Oc. Dis.		16	18		I. Tr. Eg.		18	0		I. Tr. Eg.
	1	54		I. Sh. In.		7	54		III. Oc. Re.		18	0		III. Sh. In.		19	13		III. Sh. In.
	3	3		I. Tr. In.		19	32	43.0	I. Ec. Dis.		19	13		II. Oc. Re.					II. Oc. Re.
	3	50		II. Tr. In.		22	52		I. Oc. Re.		21	25		III. Tr. In.					III. Tr. In.
	4	14		I. Sh. Eg.	13	16	44		I. Sh. In.		21	38		III. Sh. Eg.					III. Sh. Eg.
	4	27		II. Sh. Eg.		17	30		II. Sh. In.	23	1	6		III. Tr. Eg.		10	24	2.0	III. Tr. Eg.
	5	23		I. Tr. Eg.		17	45		I. Tr. In.		10	24	2.0	I. Ec. Dis.		13	33		I. Ec. Dis.
	6	45		II. Tr. Eg.		19	4		I. Sh. Eg.		13	33		I. *Oc. Re.					I. *Oc. Re.
	23	10	10.3	I. Ec. Dis.		19	28		II. Tr. In.		14	40	14.7	IV. Sh. In.					IV. Sh. In.
4	2	37		I. Oc. Re.		20	5		I. Tr. Eg.		7	34		I. Sh. In.		8	24		I. Sh. In.
	20	8	50.3	III. Ec. Dis.		20	23		II. Sh. Eg.		8	24		I. Tr. In.		9	25		I. Tr. In.
	20	15	35.5	II. Ec. Dis.		22	23		II. Tr. Eg.		9	25		II. Sh. In.		9	54		II. Sh. In.
	20	22		I. Sh. In.	14	14	1	19.0	I. *Ec. Dis.		9	54		I. Sh. Eg.					I. Sh. Eg.
	21	30		I. Tr. In.		17	19		I. Oc. Re.		10	44		I. *Tr. In.					I. *Tr. In.
	22	42		I. Sh. Eg.	15	11	13		I. *Sh. In.		11	2		II. *Tr. In.					II. *Tr. In.
	23	36	3.5	III. Ec. Re.		12	6	18.3	II. *Ec. Dis.		12	9		IV. *Sh. Eg.					IV. *Sh. Eg.
	23	50		I. Tr. Eg.		12	12		I. *Tr. In.		12	18		II. *Sh. Eg.					II. *Sh. Eg.
5	0	37		III. Oc. Dis.		13	33		I. *Sh. Eg.		13	57		II. *Tr. Eg.					II. *Tr. Eg.
	1	20		II. Oc. Re.		14	1		III. *Sh. In.		14	59		IV. *Tr. In.					IV. *Tr. In.
	4	18		III. Oc. Re.		14	32		I. *Tr. Eg.		19	49		IV. Tr. Eg.					IV. Tr. Eg.
	17	38	36.9	I. Ec. Dis.		16	53		II. Oc. Re.	25	4	52	39.7	I. Ec. Dis.					I. Ec. Dis.
	21	4		I. Oc. Re.		17	38		III. Sh. Eg.		7	59		I. Oc. Re.					I. Oc. Re.
6	14	51		I. *Sh. In.		17	56		III. Tr. In.	26	2	3		I. Sh. In.					I. Sh. In.
	14	53		II. *Sh. In.		21	37		III. Tr. Eg.		2	50		I. Tr. In.					I. Tr. In.
	15	57		I. Tr. In.		21	48	22.2	IV. Ec. Dis.		3	57	14.5	II. Ec. Dis.					II. Ec. Dis.
	17	3		II. Tr. In.	16	2	13	22.4	IV. Ec. Re.		4	23		I. Sh. Eg.					I. Sh. Eg.
	17	11		I. Sh. Eg.		6	39		IV. Oc. Dis.		5	10		I. Tr. Eg.					I. Tr. Eg.
	17	46		II. Sh. Eg.		8	29	48.8	I. Ec. Dis.		8	8	8.1	III. Ec. Dis.					III. Ec. Dis.
	18	17		I. Tr. Eg.		11	28		IV. *Oc. Re.		8	22		II. Oc. Re.					II. Oc. Re.
	19	58		II. Tr. Eg.		11	46		I. *Oc. Re.		14	53		III. *Oc. Re.					III. *Oc. Re.
7	12	7	11.4	I. *Ec. Dis.	17	5	42		I. Sh. In.		23	21	10.0	I. Ec. Dis.					I. Ec. Dis.
	13	26		IV. *Sh. In.		6	39		I. Tr. In.	27	2	26		I. Oc. Re.					I. Oc. Re.
	15	31		I. Oc. Re.		6	48		II. Sh. In.		20	31		I. Sh. In.					I. Sh. In.
	17	59		IV. Sh. Eg.		8	2		I. Sh. Eg.		21	16		I. Tr. In.					I. Tr. In.
	23	24		IV. Tr. In.		8	40		II. Tr. In.		22	44		II. Sh. In.					II. Sh. In.
8	4	13		IV. Tr. Eg.		8	59		I. Tr. Eg.		22	51		I. Sh. Eg.					I. Sh. Eg.
	9	19		I. Sh. In.		9	41		II. Sh. Eg.		23	36		I. Tr. Eg.					I. Tr. Eg.
	9	32	28.4	II. Ec. Dis.		11	35		II. *Tr. Eg.	28	0	12		II. Tr. In.					II. Tr. In.
	10	3		III. Sh. In.	18	2	58	25.2	I. Ec. Dis.		1	37		II. Sh. Eg.					II. Sh. Eg.
	10	24		I. Tr. In.		6	13		I. Oc. Re.		3	7		II. Tr. Eg.					II. Tr. Eg.
	11	39		I. *Sh. Eg.	19	0	10		I. Sh. In.		17	49	48.0	I. Ec. Dis.					I. Ec. Dis.
	12	44		I. *Tr. Eg.		1	6		I. Tr. In.		20	52		I. Oc. Re.					I. Oc. Re.
	13	40		III. *Sh. Eg.		1	23	15.0	II. Ec. Dis.	29	15	0		I. *Sh. In.					I. *Sh. In.
	14	24		III. *Tr. In.		2	30		I. Sh. Eg.		15	42		I. Tr. In.					I. Tr. In.
	14	32		II. *Oc. Re.		3	26		I. Tr. Eg.		17	14	18.6	II. Ec. Dis.					II. Ec. Dis.
	18	5		III. Tr. Eg.		4	8	14.7	III. Ec. Dis.		17	20		I. Sh. Eg.					I. Sh. Eg.
9	6	35	40.3	I. Ec. Dis.		6	3		II. Oc. Re.		18	2		I. Tr. Eg.					I. Tr. Eg.
	9	58		I. Oc. Re.		7	35	25.3	III. Ec. Re.		21	30		II. Oc. Re.					II. Oc. Re.
10	3	47		I. Sh. In.		7	44		III. Oc. Dis.		21	59		III. Sh. In.					III. Sh. In.
	4	11		II. Sh. In.		11	25		III. *Oc. Re.	30	0	50		III. Tr. In.					III. Tr. In.
	4	51		I. Tr. In.		21	26	53.8	I. Ec. Dis.		1	37		III. Sh. Eg.					III. Sh. Eg.
	6	7		I. Sh. Eg.		0	39		I. Oc. Re.		4	31		III. Tr. Eg.					III. Tr. Eg.
	6	16		II. Tr. In.		18	38		I. Sh. In.		12	18	21.0	I. *Ec. Dis.					I. *Ec. Dis.
	7	4		II. Sh. Eg.		19	32		I. Tr. In.		15	18		I. *Oc. Re.					I. *Oc. Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



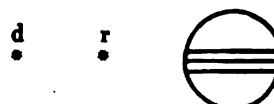
III.



II.



IV.

*Configurations at 13^h for an Inverting Telescope.*

Day.	West.			East.		
1	○ 3 [·]		1 [·]	○ 2 [·]		4 [·]
2		3 [·]		○ 1 [·] 2 [·]		4 [·]
3		3 [·] 1 [·] 2 [·]		○		4 [·]
4		3 [·] 2 [·]		○ 1 [·]		4 [·]
5		1 [·]		○ 3 [·] 2 [·]		4 [·]
6				○ 1 [·] 2 [·] 3 [·]		
7		2 [·]	1 [·] ○	4 [·] 3 [·]		
8		4 [·] 1 [·] ○ 3 [·]				2 [·] ●
9		4 [·] 3 [·]	○ 1 [·] 2 [·]			
10	4 [·] 3 [·] 1 [·] 2 [·]		○			
11	4 [·] 3 [·] 2 [·]		○ 1 [·]			
12	4 [·] 1 [·]		○ 3 [·] 2 [·]			
13	4 [·]		○ 1 [·] 2 [·]		3 [·]	
14	4 [·] 2 [·] 1 [·] ○		3 [·]			
15	○ 1 [·]	4 [·] 2 [·] ○ 3 [·]				
16		3 [·]	○ 1 [·] 2 [·]			
17		3 [·] 1 [·] 2 [·] ○		4 [·]		
18		3 [·] 2 [·]	○ 1 [·]		4 [·]	
19		1 [·]	○ 3 [·] 2 [·]		4 [·]	
20			○ 1 [·] 2 [·]	3 [·]	4 [·]	
21		2 [·] 1 [·] ○	3 [·]		4 [·]	
22		2 [·] ○ 1 [·] 3 [·]		4 [·]		
23		3 [·]	○ 2 [·] 4 [·]			1 [·] ●
24	○ 2 [·]	3 [·] 1 [·] ○ 4 [·]				
25		3 [·] 2 [·]	○ 1 [·]			
26		4 [·] 1 [·] ○	2 [·]			3 [·] ●
27	4 [·]		○ 1 [·] 2 [·] 3 [·]			
28	4 [·]	2 [·] 1 [·] ○	3 [·]			
29	4 [·]	2 [·] ○ 1 [·] 3 [·]				
30	4 [·]	3 [·] ○	2 [·]			1 [·] ●

WASHINGTON MEAN TIME.

JULY.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	9	28		I. * Sh.	In.	11	5	49		IV. Tr.	In.	21	13	38	III. * Sh.	Eg.			
	10	9		I. * Tr.	In.		5	56		I. Oc.	Re.		14	30	III. * Tr.	Eg.			
	11	48		I. * Sh.	Eg.		6	19		IV. Sh.	Eg.		18	1	52.1	I. Ec.	Dis.		
	12	2		II. * Sh.	In.		10	39		IV. * Tr.	Eg.		20	32	I. Oc.	Re.			
	12	29		I. * Tr.	Eg.	12	0	19		I. Sh.	In.	22	15	10	I. Sh.	In.			
	13	22		II. * Tr.	In.		0	46		I. Tr.	In.		15	21	I. Tr.	In.			
	14	55		II. Sh.	Eg.		2	39		I. Sh.	Eg.		17	30	I. Sh.	Eg.			
	16	17		II. Tr.	Eg.		3	6		I. Tr.	Eg.		17	41	I. Tr.	Eg.			
2	6	47	0.2	I. Ec.	Dis.		3	57		II. Sh.	In.		19	53	II. Sh.	In.			
	9	45		I. * Oc.	Re.		4	50		II. Tr.	In.		20	14	II. Tr.	In.			
	15	52	39.9	IV. Ec.	Dis.		6	51		II. Sh.	Eg.		22	47	II. Sh.	Eg.			
	20	21	8.1	IV. Ec.	Re.		7	45		II. Tr.	Eg.		23	9	II. Tr.	Eg.			
	21	46		IV. Oc.	Dis.		21	38	39.5	I. Ec.	Dis.	23	12	30	36.0	I. * Ec.	Dis.		
3	2	36		IV. Oc.	Re.	13	0	22		I. Oc.	Re.		14	58	I. Oc.	Re.			
	3	57		I. Sh.	In.		18	48		I. Sh.	In.	24	9	39	I. * Sh.	In.			
	4	35		I. Tr.	In.		19	11		I. Tr.	In.		9	46	I. * Tr.	In.			
	6	17		I. Sh.	Eg.		21	8		I. Sh.	Eg.		11	59	I. * Sh.	Eg.			
	6	31	22.9	II. Ec.	Dis.		21	31		I. Tr.	Eg.		12	6	I. * Tr.	Eg.			
	6	55		I. Tr.	Eg.		22	22	55.8	II. Ec.	Dis.		14	14	54.0	II. * Ec.	Dis.		
	10	39		II. * Oc.	Re.	14	2	2		II. Oc.	Re.		17	22	II. Oc.	Re.			
	12	7	34.8	III. * Ec.	Dis.		5	59		III. Sh.	In.	25	0	6	43.6	III. Ec.	Dis.		
	16	17		III. Oc.	Re.		7	32		III. Tr.	In.		4	12	III. Oc.	Re.			
4	1	15	31.8	I. Ec.	Dis.		9	38		III. * Sh.	Eg.		6	59	12.9	I. Ec.	Dis.		
	4	11		I. Oc.	Re.		11	13		III. * Tr.	Eg.		9	24	I. * Oc.	Re.			
	22	25		I. Sh.	In.		16	7	15.3	I. Ec.	Dis.	26	4	8	I. Sh.	In.			
	23	1		I. Tr.	In.		18	48		I. Oc.	Re.		4	12	I. Tr.	In.			
5	0	45		I. Sh.	Eg.	15	13	16		I. * Sh.	In.		6	28	I. Sh.	Eg.			
	1	21		II. Sh.	In.		13	37		I. * Tr.	In.		6	32	I. Tr.	Eg.			
	1	21		I. Tr.	Eg.		15	36		I. Sh.	Eg.		9	12	II. Sh.	In.			
	2	32		II. Tr.	In.		15	57		I. Tr.	Eg.		9	22	II. * Tr.	In.			
	4	14		II. Sh.	Eg.		17	16		II. Sh.	In.		12	6	II. * Sh.	Eg.			
	5	27		II. Tr.	Eg.		17	58		II. Tr.	In.		12	17	II. * Tr.	Eg.			
	19	44	11.0	I. Ec.	Dis.		20	10		II. Sh.	Eg.	27	1	27	56.7	I. Ec.	Dis.		
	22	38		I. Oc.	Re.		20	53		II. Tr.	Eg.		3	50	I. Oc.	Re.			
6	16	54		I. Sh.	In.	16	10	35	57.3	I. Ec.	Dis.		19	48	IV. Sh.	In.			
	17	28		I. Tr.	In.		13	14		I. * Oc.	Re.		20	12	IV. Tr.	In.			
	19	14		I. Sh.	Eg.	17	7	45		I. Sh.	In.		22	36	I. Sh.	In.			
	19	46		I. Tr.	Eg.		8	3		I. Tr.	In.		22	38	I. Tr.	In.			
	19	48	32.0	II. Ec.	Dis.		10	5		I. * Sh.	Eg.	28	0	31	IV. Sh.	Eg.			
	23	47		II. Oc.	Re.		10	23		I. * Tr.	Eg.		0	56	I. Sh.	Eg.			
7	1	59		III. Sh.	In.		11	40	11.4	II. * Ec.	Dis.		0	58	I. Tr.	Eg.			
	4	12		III. Tr.	In.		15	9		II. Oc.	Re.		1	1	IV. Tr.	Eg.			
	5	38		III. Sh.	Eg.		20	6	45.8	III. Ec.	Dis.		3	32	20.4	II. Ec.	Dis.		
	7	54		III. Tr.	Eg.	18	0	55		III. Oc.	Re.		6	29	II. Oc.	Re.			
	14	12	45.3	I. * Ec.	Dis.		5	4	32.0	I. Ec.	Dis.		13	59	III. * Sh.	In.			
	17	5		I. Oc.	Re.		7	40		I. Oc.	Re.		14	5	III. * Tr.	In.			
8	11	22		I. Sh.	In.	19	2	13		I. Sh.	In.		17	39	III. Sh.	Eg.			
	11	54		I. Tr.	In.		2	29		I. Tr.	In.		17	46	III. Tr.	Eg.			
	13	42		I. Sh.	Eg.		4	33		I. Sh.	Eg.		19	56	I. Oc.	Dis.			
	14	14		I. Tr.	Eg.		4	49		I. Tr.	Eg.		22	16	I. Oc.	Re.			
	14	39		II. Sh.	In.		6	35		II. Sh.	In.	29	17	4	I. Tr.	In.			
	15	41		II. Tr.	In.		7	6		II. Tr.	In.		17	5	I. Sh.	In.			
	17	33		II. Sh.	Eg.		9	29		II. * Sh.	Eg.		19	24	I. Tr.	Eg.			
	18	36		II. Tr.	Eg.		9	58	28.3	IV. * Ec.	Dis.		19	25	I. Sh.	Eg.			
9	8	41	25.7	I. Ec.	Dis.		10	1		II. * Tr.	Eg.		22	30	II. Tr.	In.			
	11	30		I. * Oc.	Re.		17	4		IV. Oc.	Re.		22	30	II. Sh.	In.			
10	5	51		I. Sh.	In.		23	33	14.3	I. Ec.	Dis.	30	1	24	II. Tr.	Eg.			
	6	20		I. Tr.	In.	20	2	6		I. Oc.	Re.		1	25	II. Sh.	Eg.			
	8	11		I. Sh.	Eg.		20	42		I. Sh.	In.		14	22	I. * Oc.	Dis.			
	8	40		I. Tr.	Eg.		20	55		I. Tr.	In.		16	42	I. Oc.	Re.			
	9	5	41.4	II. Ec.	Dis.		23	2		I. Sh.	Eg.		11	30	I. * Tr.	In.			
	12	54		II. * Oc.	Re.		23	15		I. Tr.	Eg.		11	33	I. * Sh.	In.			
	16	7	2.2	III. Ec.	Dis.	21	0	57	31.4	II. Ec.	Dis.		13	50	I. * Tr.	Eg.			
	21	37		III. Oc.	Re.		4	16		II. Oc.	Re.		13	53	I. * Sh.	Eg.			
11	1	39		IV. Sh.	In.		9	59		III. * Sh.	In.		16	41	II. Oc.	Dis.			
	3	9	58.9	I. Ec.	Dis.		10	49		III. * Tr.	In.		19	38	8.4	II. Ec.	Re.		

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



II.



IV.

*Configurations at 12^h for an Inverting Telescope.*

Day.	West.				East.			
1	○ 1 [•]				○ 2 [•]			
2		3 [•]	2 [•]	4 [•]	○ 1 [•]			
3				1 [•] 3 [•]	○ 2 [•] 4 [•]			
4					○ 1 [•] 2 [•] 3 [•] 4 [•]			
5				1 [•]	○ 3 [•] 4 [•]			
6				2 [•]	○ 1 [•] 3 [•] 4 [•]			
7				3 [•] 1 [•]	○ 2 [•] 4 [•]			
8	○ 1 [•]		3 [•]		○ 2 [•] 4 [•]			
9		3 [•] 2 [•]			○ 1 [•] 4 [•]			
10			1 [•]		○ 4 [•] 2 [•]			
11			4 [•]		○ 1 [•] 2 [•] 3 [•]			
12		4 [•] 1 [•] 2 [•]			○ 3 [•]			
13		4 [•] 2 [•]			○ 1 [•] 3 [•]			
14		4 [•] 1 [•] 3 [•]			○ 2 [•]			
15	4 [•]	3 [•] 2 [•]			○ 1 [•] 3 [•]			
16	4 [•]	3 [•] 2 [•]			○ 1 [•]			
17		4 [•] 3 [•]			○ 1 [•] 2 [•] 3 [•]			
18		4 [•] 3 [•]			○ 1 [•] 2 [•] 3 [•]			
19		1 [•] 2 [•]			○ 3 [•]			
20		2 [•]			○ 1 [•] 2 [•] 3 [•]			
21	○ 3 [•]		1 [•]		○ 2 [•] 4 [•]			
22		3 [•]			○ 1 [•] 2 [•] 4 [•]			
23		3 [•] 2 [•]			○ 1 [•] 2 [•] 4 [•]			
24	○ 1 [•]		3 [•] 2 [•]		○ 4 [•]			
25					○ 1 [•] 2 [•] 3 [•] 4 [•]			
26			1 [•] 2 [•]		○ 4 [•] 1 [•] 3 [•]			
27			2 [•]		○ 4 [•] 1 [•] 3 [•]			
28			4 [•] 1 [•]		○ 3 [•] 2 [•]			
29		4 [•]			○ 1 [•] 2 [•]			
30		4 [•] 3 [•] 2 [•]			○ 1 [•]			
31	○ 1 [•]	4 [•]	3 [•] 2 [•]		○			

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	3	47		III. Oc. Dis.	11	23	24		I. Oc. Dis.	21	21	37		IV. Oc. Re.					
	7	38	0.3	III. Ec. Re.	12	0	19		III. Tr. Eg.		22	12	7.9	IV. Ec. Dis.					
	8	48		I. * Oc. Dis.		1	39		III. Sh. Eg.		23	25		II. Oc. Dis.					
	11	9	54.9	I. * Ec. Re.		2	2	14.2	I. Ec. Re.	22	2	48	51.5	IV. Ec. Re.					
2	5	56		I. Tr. In.		20	32		I. Tr. In.		3	25	16.9	II. Ec. Re.					
	6	2		I. Sh. In.		20	53		I. Sh. In.		13	42		III. * Oc. Dis.					
	8	16		I. Tr. Eg.		22	52		I. Tr. Eg.		14	2		I. Oc. Dis.					
	8	22		I. * Sh. Eg.		23	13		I. Sh. Eg.		16	54	46.8	I. Ec. Re.					
	11	38		II. * Tr. In.	13	3	2		II. Tr. In.		19	40	24.8	III. Ec. Re.					
	11	49		II. * Sh. In.		3	45		II. Sh. In.	23	11	8		I. * Tr. In.					
	14	33		II. Tr. Eg.		5	57		II. Tr. Eg.		11	45		I. * Sh. In.					
	14	43		II. Sh. Eg.		6	39		II. Sh. Eg.		13	28		I. * Tr. Eg.					
3	3	14		I. Oc. Dis.		10	31		IV. * Tr. In.		14	6		I. Sh. Eg.					
	5	38	39.5	I. Ec. Re.		13	57		IV. Sh. In.		18	28		II. Tr. In.					
4	0	22		I. Tr. In.		15	19		IV. Tr. Eg.		19	41		II. Sh. In.					
	0	30		I. Sh. In.		17	50		I. Oc. Dis.		21	22		II. Tr. Eg.					
	2	42		I. Tr. Eg.		18	43		IV. Sh. Eg.		22	35		II. Sh. Eg.					
	2	50		I. Sh. Eg.		20	31	2.3	I. Ec. Re.	24	8	28		I. * Oc. Dis.					
	5	48		II. Oc. Dis.	14	14	58		I. Tr. In.		11	23	35.2	I. Ec. Re.					
	8	55	49.5	II. * Ec. Re.		15	21		I. Sh. In.	25	5	35		I. Tr. In.					
	17	21		III. Tr. In.		17	18		I. Tr. Eg.		6	14		I. Sh. In.					
	17	59		III. Sh. In.		17	41		I. Sh. Eg.		7	55		I. Tr. Eg.					
	21	2		III. Tr. Eg.		21	9		II. Oc. Dis.		8	35		I. * Sh. Eg.					
	21	39		III. Sh. Eg.	15	0	49	18.7	II. Ec. Re.		12	34		II. * Oc. Dis.					
	21	40		I. Oc. Dis.		10	22		III. * Oc. Dis.		16	43	16.6	II. Ec. Re.					
5	0	7	20.0	I. Ec. Re.		12	17		I. * Oc. Dis.	26	2	54		I. Oc. Dis.					
	2	25		IV. Oc. Dis.		14	59	43.7	I. Ec. Re.		3	19		III. Tr. In.					
	8	39	2.8	IV. * Ec. Re.		15	39	47.4	III. Ec. Re.		5	52	19.8	I. Ec. Re.					
	18	48		I. Tr. In.	16	9	24		I. * Tr. In.		6	0		III. Sh. In.					
	18	59		I. Sh. In.		9	50		I. * Sh. In.		7	0		III. Tr. Eg.					
	21	8		I. Tr. Eg.		11	44		I. * Tr. Eg.		9	41		III. * Sh. Eg.					
	21	19		I. Sh. Eg.		12	10		I. * Sh. Eg.	27	0	1		I. Tr. In.					
6	0	46		II. Tr. In.		16	10		II. Tr. In.		0	43		I. Sh. In.					
	1	7		II. Sh. In.		17	4		II. Sh. In.		2	21		I. Tr. Eg.					
	3	41		II. Tr. Eg.		19	4		II. Tr. Eg.		3	4		I. Sh. Eg.					
	4	1		II. Sh. Eg.		19	58		II. Sh. Eg.		7	37		II. Tr. In.					
	16	6		I. Oc. Dis.	17	6	43		I. Oc. Dis.		8	59		II. * Sh. In.					
	18	36	6.4	I. Ec. Re.		9	28	30.9	I. * Ec. Re.		10	31		II. * Tr. Eg.					
7	13	14		I. * Tr. In.	18	3	50		I. Tr. In.		11	54		II. * Sh. Eg.					
	13	27		I. * Sh. In.		4	19		I. Sh. In.		21	21		I. Oc. Dis.					
	15	34		I. Tr. Eg.		6	10		I. Tr. Eg.	28	0	21	10.2	I. Ec. Re.					
	15	47		I. Sh. Eg.		6	39		I. Sh. Eg.		18	28		I. Tr. In.					
	18	55		II. Oc. Dis.		10	17		II. * Oc. Dis.		19	12		I. Sh. In.					
	22	13	36.1	II. Ec. Re.		14	7	12.7	II. Ec. Re.		20	48		I. Tr. Eg.					
8	7	4		III. Oc. Dis.		23	57		III. Tr. In.		21	33		I. Sh. Eg.					
	10	32		I. * Oc. Dis.	19	1	9		I. Oc. Dis.	29	1	43		II. Oc. Dis.					
	11	38	43.6	III. * Ec. Re.		1	59		III. Sh. In.		6	1	30.2	II. Ec. Re.					
	13	4	46.0	I. * Ec. Re.		3	38		III. Tr. Eg.		15	48		I. Oc. Dis.					
9	7	40		I. Tr. In.		3	57	14.4	I. Ec. Re.		17	5		III. Oc. Dis.					
	7	56		I. Sh. In.		5	40		III. Sh. Eg.		18	49	54.2	I. Ec. Re.					
	10	0		I. * Tr. Eg.		22	16		I. Tr. In.		23	41	1.9	III. Ec. Re.					
	10	16		I. * Sh. Eg.		22	47		I. Sh. In.	30	1	14		IV. Tr. In.					
	13	54		II. Tr. In.	20	0	36		I. Tr. Eg.		6	1		IV. Tr. Eg.					
	14	26		II. Sh. In.		1	8		I. Sh. Eg.		8	7		IV. Sh. In.					
	16	49		II. Tr. Eg.		5	19		II. Tr. In.		12	55		IV. * Sh. Eg.					
	17	20		II. Sh. Eg.		6	22		II. Sh. In.		12	55		I. * Tr. In.					
10	4	58		I. Oc. Dis.		8	13		II. Tr. Eg.		13	40		I. * Sh. In.					
	7	33	32.1	I. Ec. Re.		9	16		II. * Sh. Eg.		15	15		I. Tr. Eg.					
11	2	6		I. Tr. In.		19	35		I. Oc. Dis.		16	1		I. Sh. Eg.					
	2	24		I. Sh. In.		22	26	4.0	I. Ec. Re.		20	46		II. Tr. In.					
	4	26		I. Tr. Eg.	21	16	42		I. Tr. In.		22	18		II. Sh. In.					
	4	44		I. Sh. Eg.		16	48		IV. Oc. Dis.		23	40		II. Tr. Eg.					
	8	2		II. Oc. Dis.		17	16		I. Sh. In.		1	13		II. Sh. Eg.					
	11	31	23.2	II. Ec. Re.		19	2		I. Tr. Eg.	31	10	14		I. * Oc. Dis.					
	20	38		III. Tr. In.		19	37		I. Sh. Eg.		13	18	43.7	I. * Ec. Re.					
	21	59		III. Sh. In.															

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



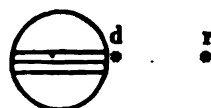
III.



II.



IV.

*Configurations at 11^h for an Inverting Telescope.*

Day.	West.				East.			
1		4			○	3	2	1 ●
2		4		1	○	2	3	
3		4	2		○	1	3	
4			41		○	3	3	
5			3		○	4	1 2	
6		3		1	○		4	
7			3	2	○	1		4
8					○	3	2	4 1 ●
9				1	○	2	3	4
10			2		○	1	3	4
11			1		○	3	4	2 ●
12			3		○	1 2	4	
13	○	4		3	○			
14			3 4	2	○	1		
15		4		1	○	2		3 ●
16	○	1	4		○	2	3	
17		4		2	○	1	3	
18		4		1	○	3		2 ●
19		4		3	○	1 2		
20			3	1 2	○			
21			3	2	○	1		
22				1	○	3		
23					○	1	2 3	4
24			2		○	1	3	4
25				1 2	○	3		4
26				3	○	1	2	4
27			3	1 2	○			4
28			3	2	○	1		4
29				1	○	3		
30				4	○	1	2 3	
31			4	2	○		3	1 ●

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s		d	h	m	s		d	h	m	s	
1	7	21		I. Tr. In.	10	17	8		II. Sh. Eg.	20	20	38		I. Tr. Eg.
	8	9		I.* Sh. In.	11	0	55		I. Oc. Dis.		21	45		I. Sh. Eg.
	9	41		I.* Tr. Eg.		4	11	34.6	I. Ec. Re.	21	3	54		II. Tr. In.
	10	29		I.* Sh. Eg.		22	2		I. Tr. In.		6	9		II. Sh. In.
	14	52		II. Oc. Dis.		23	1		I. Sh. In.		6	48		II. Tr. Eg.
	19	19	36.0	II. Ec. Re.	12	0	22		I. Tr. Eg.		9	4		II.* Sh. Eg.
2	4	41		I. Oc. Dis.		1	21		I. Sh. Eg.		15	39		I. Oc. Dis.
	6	45		III. Tr. In.		6	23		II. Oc. Dis.		19	4	30.6	I. Ec. Re.
	7	47	29.3	I.* Ec. Re.		11	14	41.6	II. Ec. Re.	22	12	46		I. Tr. In.
	10	1		III.* Sh. In.		19	22		I. Oc. Dis.		13	54		I. Sh. In.
	10	25		III.* Tr. Eg.		22	40	20.9	I. Ec. Re.		15	6		I. Tr. Eg.
	13	42		III. Sh. Eg.	13	0	3		III. Oc. Dis.		16	14		I. Sh. Eg.
3	1	48		I. Tr. In.		3	43		III. Oc. Re.		22	0		II. Oc. Dis.
	2	37		I. Sh. In.		4	10	48.8	III. Ec. Dis.	23	3	10	0.1	II. Ec. Re.
	4	8		I. Tr. Eg.		7	42	5.8	III.* Ec. Re.		10	7		I.* Oc. Dis.
	4	57		I. Sh. Eg.		16	29		I. Tr. In.		13	33	18.8	I. Ec. Re.
	9	56		II. Tr. In.		17	30		I. Sh. In.		17	25		III. Tr. In.
	11	36		II. Sh. In.		18	49		I. Tr. Eg.		21	5		III. Tr. Eg.
	12	50		II. Tr. Eg.		19	50		I. Sh. Eg.		22	4		III. Sh. In.
	14	31		II. Sh. Eg.	14	1	29		II. Tr. In.		23	39		IV. Oc. Dis.
	23	8		I. Oc. Dis.		3	32		II. Sh. In.	24	1	46		III. Sh. Eg.
4	2	16	20.7	I. Ec. Re.		4	23		II. Tr. Eg.		4	25		IV. Oc. Re.
	20	14		I. Tr. In.		6	27		II. Sh. Eg.		7	13		I. Tr. In.
	21	6		I. Sh. In.		13	49		I. Oc. Dis.		8	23		I.* Sh. In.
	22	34		I. Tr. Eg.		17	9	11.7	I. Ec. Re.		9	33		I.* Tr. Eg.
	23	26		I. Sh. Eg.	15	10	56		I.* Tr. In.		10	30	18.4	IV.* Ec. Dis.
5	4	2		II. Oc. Dis.		11	59		I. Sh. In.		10	43		I.* Sh. Eg.
	8	37	58.6	II.* Ec. Re.		13	16		I. Tr. Eg.		15	10	46.0	IV. Ec. Re.
	17	34		I. Oc. Dis.		14	19		I. Sh. Eg.		17	7		II. Tr. In.
	20	32		III. Oc. Dis.		16	43		IV. Tr. In.		19	27		II. Sh. In.
	20	45	5.7	I. Ec. Re.		19	35		II. Oc. Dis.		20	1		II. Tr. Eg.
6	3	41	54.5	III. Ec. Re.		21	29		IV. Tr. Eg.		22	22		II. Sh. Eg.
	14	41		I. Tr. In.	16	0	32	58.0	II. Ec. Re.	25	4	34		I. Oc. Dis.
	15	35		I. Sh. In.		2	19		IV. Sh. In.		8	2	12.1	I.* Ec. Re.
	17	1		I. Tr. Eg.		7	10		IV. Sh. Eg.	26	1	41		I. Tr. In.
	17	55		I. Sh. Eg.		8	17		I.* Oc. Dis.		2	52		I. Sh. In.
	23	7		II. Tr. In.		11	37	59.1	I. Ec. Re.		4	1		I. Tr. Eg.
7	0	55		II. Sh. In.		13	48		III. Tr. In.		5	12		I. Sh. Eg.
	2	1		II. Tr. Eg.		17	28		III. Tr. Eg.		11	14		II.* Oc. Dis.
	3	50		II. Sh. Eg.		18	3		III. Sh. In.		16	28	49.6	II. Ec. Re.
	7	48		IV.* Oc. Dis.		21	45		III. Sh. Eg.		23	1		I. Oc. Dis.
	12	1		I. Oc. Dis.	17	5	23		I. Tr. In.	27	2	30	59.5	I. Ec. Re.
	12	35		IV. Oc. Re.		6	28		I. Sh. In.		7	20		III. Oc. Dis.
	15	13	55.8	I. Ec. Re.		7	42		I.* Tr. Eg.		11	0		III.* Oc. Re.
	16	21	7.0	IV. Ec. Dis.		8	48		I.* Sh. Eg.		12	13	32.3	III. Ec. Dis.
	20	59	49.8	IV. Ec. Re.		14	41		II. Tr. In.		15	46	2.9	III. Ec. Re.
8	9	8		I.* Tr. In.		16	50		II. Sh. In.		20	9		I. Tr. In.
	10	4		I.* Sh. In.		17	35		II. Tr. Eg.		21	21		I. Sh. In.
	11	28		I. Tr. Eg.		19	45		II. Sh. Eg.		22	29		I. Tr. Eg.
	12	24		I. Sh. Eg.	18	2	44		I. Oc. Dis.		23	41		I. Sh. Eg.
	17	12		II. Oc. Dis.		6	6	52.2	I. Ec. Re.	28	6	21		II. Tr. In.
	21	56		II. Ec. Re.		23	51		I. Tr. In.		8	45		II.* Sh. In.
9	6	28	8.9	I. Oc. Dis.	19	0	57		I. Sh. In.		9	15		II.* Tr. Eg.
	9	42	42.3	I.* Ec. Re.		2	11		I. Tr. Eg.		11	41		II. Sh. Eg.
	10	14		III.* Tr. In.		3	17		I. Sh. Eg.		17	30		I. Oc. Dis.
	13	54		III. Tr. Eg.		8	47		II.* Oc. Dis.		20	59	51.0	I. Ec. Re.
	14	2		III. Sh. In.		13	51	38.9	II. Ec. Re.	29	14	37		I. Tr. In.
	17	44		III. Sh. Eg.		21	12		I. Oc. Dis.		15	50		I. Sh. In.
10	3	35		I. Tr. In.	20	0	35	39.4	I. Ec. Re.		16	57		I. Tr. Eg.
	4	32		I. Sh. In.		3	39		III. Oc. Dis.		18	10		I. Sh. Eg.
	5	55		I. Tr. Eg.		7	19		III. Oc. Re.	30	0	28		II. Oc. Dis.
	6	52		I. Sh. Eg.		8	12	23.4	III.* Ec. Dis.		5	47	14.8	II. Ec. Re.
	12	18		II. Tr. In.		11	44	43.6	III. Ec. Re.		11	58		I. Oc. Dis.
	14	13		II. Sh. In.		18	18		I. Tr. In.		15	28	39.5	I. Ec. Re.
	15	12		II. Tr. Eg.		19	25		I. Sh. In.		21	9		III. Tr. In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite, Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

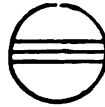
Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



r

III.



d

r

II.



r

IV.



d

r

Configurations at 9^h 30^m for an Inverting Telescope.

Day.	West.				East.			
1	○ 1 ^h		4 ^h	-2	○		3 ^h	
2	○ 3 ^h	4 ^h			○	1 ^h	-2	
3	○ 2 ^h	-4 ^h		3 ^h 1 ^h	○			
4		-4 ^h	-3 ^h -2 ^h		○	1 ^h		
5			-4 ^h 1 ^h		○	-2 ^h		
6			-4 ^h		○	3 ^h 2 ^h		
7			2 ^h -1 ^h		○		3 ^h	-4 ^h ●
8	○ 1 ^h		-2 ^h		○	-4 ^h 3 ^h		
9					○	1 ^h -2 ^h	-4 ^h	
10			3 ^h 1 ^h		○	2 ^h	-4 ^h	
11			-3 ^h 2 ^h		○	1 ^h	-4 ^h	
12			-3 ^h 1 ^h		○	-2 ^h	4 ^h	
13					○	1 ^h 2 ^h	4 ^h	
14			2 ^h -1 ^h		○		4 ^h 3 ^h	
15			-2 ^h		○	1 ^h 4 ^h	3 ^h	
16			4 ^h		○	3 ^h -2 ^h		-1 ^h ●
17			4 ^h 3 ^h 1 ^h		○	2 ^h		
18		4 ^h 3 ^h 2 ^h			○	1 ^h		
19		4 ^h	-3 ^h 1 ^h		○			-2 ^h ●
20		-4 ^h			○	3 ^h 1 ^h 2 ^h		
21		-4 ^h		-12 ^h	○		3 ^h	
22			-4 ^h -2 ^h		○	1 ^h 3 ^h		
23			-4 ^h -1 ^h		○	3 ^h -2 ^h		
24	○ 1 ^h		3 ^h		○	-4 ^h 2 ^h		
25			3 ^h 2 ^h		○	1 ^h	-4 ^h	
26			-3 ^h 1 ^h -2 ^h		○		-4 ^h	
27					○	-1 ^h -2 ^h	-4 ^h	-3 ^h ●
28			-1 ^h 2 ^h		○	-3 ^h	4 ^h	
29			-2 ^h		○	1 ^h 3 ^h	4 ^h	
30			-1 ^h		○	-2 ^h 3 ^h	4 ^h	

WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s				
1	0	48		III.	Tr.	Eg.	11	4	40	17.0	IV.	Ec.	Dis.	21	13	40	6.3	II.	Ec.	Re.	
	2	5		III.	Sh.	In.		6	21	43.6		I.	Ec.	Re.		17	37		I.	Ec.	Dis.
	5	47		III.	Sh.	Eg.		9	22	5.4	IV.	Ec.	Re.		21	14	46.0		I.	Ec.	Re.
	9	5		I.	Tr.	In.		14	56		III.	Ec.	Dis.	22	8	47		III.	Tr.	In.	
	10	18		I.	Sh.	In.		18	36		III.	Ec.	Re.		12	27		III.	Tr.	Eg.	
	11	25		I.	Tr.	Eg.		20	15	51.4	III.	Ec.	Dis.		14	10		III.	Sh.	In.	
	12	38		I.	Sh.	Eg.		23	48	39.8	III.	Ec.	Re.		14	45		I.	Tr.	In.	
	19	36		II.	Tr.	In.		23	53		I.	Tr.	In.		16	5		I.	Sh.	In.	
	22	4		II.	Sh.	In.	12	1	11		I.	Sh.	In.		17	6		I.	Tr.	Eg.	
	22	30		II.	Tr.	Eg.		2	14		I.	Tr.	Eg.		17	52		III.	Sh.	Eg.	
2	1	0		II.	Sh.	Eg.		3	32		I.	Sh.	Eg.		18	25		I.	Sh.	Eg.	
	6	25		I.	Ec.	Dis.		11	21		II.	Tr.	In.	23	3	11		II.	Tr.	In.	
	9	6		IV.	Tr.	In.		13	58		II.	Sh.	In.		5	53		II.	Sh.	In.	
	9	57	33.1	I.	Ec.	Re.		14	15		II.	Tr.	Eg.		6	5		II.	Tr.	Eg.	
	13	51		IV.	Tr.	Eg.		16	54		II.	Sh.	Eg.		8	49		II.	Sh.	Eg.	
	20	31		IV.	Sh.	In.		21	14		I.	Ec.	Dis.		12	5		I.	Ec.	Dis.	
3	1	23		IV.	Sh.	Eg.	13	0	50	34.7	I.	Ec.	Re.		15	43	38.8	I.	Ec.	Re.	
	3	33		I.	Tr.	In.		18	22		I.	Tr.	In.	24	9	14		I.	Tr.	In.	
	4	47		I.	Sh.	In.		19	40		I.	Sh.	In.		10	34		I.	Sh.	In.	
	5	53		I.	Tr.	Eg.		20	43		I.	Tr.	Eg.		11	35		I.	Tr.	Eg.	
	7	7		I.	Sh.	Eg.		22	0		I.	Sh.	Eg.		12	54		I.	Sh.	Eg.	
	13	43		II.	Ec.	Dis.	14	5	30		II.	Ec.	Dis.		21	24		II.	Ec.	Dis.	
	19	6	12.2	II.	Ec.	Re.		11	2	18.7	II.	Ec.	Re.	25	2	59	25.1	II.	Ec.	Re.	
4	0	53		I.	Ec.	Dis.		15	43		I.	Ec.	Dis.		6	34		I.	Ec.	Dis.	
	4	26	21.3	I.	Ec.	Re.		19	19	23.7	I.	Ec.	Re.		10	12	27.7	I.	Ec.	Re.	
	11	6		III.	Ec.	Dis.	15	4	50		III.	Tr.	In.		22	49		III.	Ec.	Dis.	
	14	46		III.	Ec.	Re.		8	30		III.	Tr.	Eg.	26	2	30		III.	Ec.	Re.	
	16	14	56.6	III.	Ec.	Dis.		10	8		III.	Sh.	In.		3	43		I.	Tr.	In.	
	19	47	36.8	III.	Ec.	Re.		12	50		I.	Tr.	In.		4	17	49.4	III.	Ec.	Dis.	
	22	1		I.	Tr.	In.		13	51		III.	Sh.	Eg.		5	3		I.	Sh.	In.	
	23	16		I.	Sh.	In.		14	9		I.	Sh.	In.		6	3		I.	Tr.	Eg.	
5	0	21		I.	Tr.	Eg.		15	11		I.	Tr.	Eg.		7	23		I.	Sh.	Eg.	
	1	36		I.	Sh.	Eg.		16	29		I.	Sh.	Eg.		7	50	49.6	III.	Ec.	Re.	
	8	51		II.	Tr.	In.	16	0	37		II.	Tr.	In.		16	29		II.	Tr.	In.	
	11	22		II.	Sh.	In.		3	17		II.	Sh.	In.		19	11		II.	Sh.	In.	
	11	45		II.	Tr.	Eg.		3	31		II.	Tr.	Eg.		19	23		II.	Tr.	Eg.	
	14	18		II.	Sh.	Eg.		6	13		II.	Sh.	Eg.		22	7		II.	Sh.	Eg.	
	19	21		I.	Ec.	Dis.		10	11		I.	Ec.	Dis.	27	1	3		I.	Ec.	Dis.	
	22	55	12.8	I.	Ec.	Re.		13	48	17.0	I.	Ec.	Re.		4	41	18.5	I.	Ec.	Re.	
6	16	29		I.	Tr.	In.	17	7	18		I.	Tr.	In.		10	20		IV.	Ec.	Dis.	
	17	45		I.	Sh.	In.		8	38		I.	Sh.	In.		15	6		IV.	Ec.	Re.	
	18	49		I.	Tr.	Eg.		9	39		I.	Tr.	Eg.		22	12		I.	Tr.	In.	
	20	5		I.	Sh.	Eg.		10	58		I.	Sh.	Eg.		22	51	23.3	IV.	Ec.	Dis.	
7	2	58		II.	Ec.	Dis.		18	48		II.	Ec.	Dis.		23	32		I.	Sh.	In.	
	8	24	41.2	II.	Ec.	Re.	18	0	21	31.0	II.	Ec.	Re.	28	0	33		I.	Tr.	Eg.	
	13	49		I.	Ec.	Dis.		4	39		I.	Ec.	Dis.		1	52		I.	Sh.	Eg.	
	17	24	1.5	I.	Ec.	Re.		8	17	5.8	I.	Ec.	Re.		3	34	9.7	IV.	Ec.	Re.	
8	0	56		III.	Tr.	In.		18	50		III.	Ec.	Dis.		10	43		II.	Ec.	Dis.	
	4	36		III.	Tr.	Eg.		22	30		III.	Ec.	Re.		16	18	2.8	II.	Ec.	Re.	
	6	6		III.	Sh.	In.	19	0	16	43.5	III.	Ec.	Dis.		19	32		I.	Ec.	Dis.	
	9	49		III.	Sh.	Eg.		1	47		I.	Tr.	In.		23	10	7.0	I.	Ec.	Re.	
	10	57		I.	Tr.	In.		2	28		IV.	Tr.	In.	29	12	49		III.	Tr.	In.	
	12	14		I.	Sh.	In.		3	7		I.	Sh.	In.		16	29		III.	Tr.	Eg.	
	13	17		I.	Tr.	Eg.		3	49	38.5	III.	Ec.	Re.		16	41		I.	Tr.	In.	
	14	34		I.	Sh.	Eg.		4	8		I.	Tr.	Eg.		18	1		I.	Sh.	In.	
	22	6		II.	Tr.	In.		5	27		I.	Sh.	Eg.		18	12		III.	Sh.	In.	
9	0	40		II.	Sh.	In.		7	14		IV.	Tr.	Eg.		19	2		I.	Tr.	Eg.	
	1	0		II.	Tr.	Eg.		13	54		II.	Tr.	In.		20	21		I.	Sh.	Eg.	
	3	36		II.	Sh.	Eg.		14	43		IV.	Sh.	In.		21	54		III.	Sh.	Eg.	
	8	18		I.	Ec.	Dis.		16	35		II.	Sh.	In.	30	5	48		II.	Tr.	In.	
	11	52	55.0	I.	Ec.	Re.		16	48		II.	Tr.	Eg.		8	29		II.	Sh.	In.	
10	5	25		I.	Tr.	In.		19	31		II.	Sh.	Eg.		8	42		II.	Tr.	Eg.	
	6	43		I.	Sh.	In.		19	37		IV.	Sh.	Eg.		11	25		II.	Sh.	Eg.	
	7	46		I.	Tr.	Eg.		23	8		I.	Ec.	Dis.		14	1		I.	Ec.	Dis.	
	9	3		I.	Sh.	Eg.	20	2	45	57.4	I.	Ec.	Re.		17	38	59.5	I.	Ec.	Re.	
	16	14		II.	Ec.	Dis.		20	16		I.	Tr.	In.	31	11	10		I.	Tr.	In.	
	16	30		IV.	Ec.	Dis.		21	36		I.	Sh.	In.		12	30		I.	Sh.	In.	
	21	16		IV.	Ec.	Re.		22	37		I.	Tr.	Eg.		13	31		I.	Tr.	Eg.	
	21	43	46.4	II.	Ec.	Re.		23	56		I.	Sh.	Eg.		14	50		I.	Sh.	Eg.	
11	2	46		I.	Ec.	Dis.	21	8	5		II.	Ec.	Dis.								

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

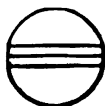
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

r
•

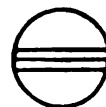
III.

d
•r
•

II.

r
•

IV.

d
•r
•*Configurations at 8^h for an Inverting Telescope.*

Day.	West.				East.			
1			3 [•]	○ 1 [•]	2 [•]	4 [•]		
2	○ 4 [•]		3 [•]	2 [•]	○			1 [•] ●
3			3 [•]	4 [•]	21 [•]	○		
4		4 [•]		3 [•]	○	1 [•]	2 [•]	
5		4 [•]		1 [•]	○ 2 [•]		3 [•]	
6		4 [•]		2 [•]	○	1 [•]	3 [•]	
7		4 [•]		1 [•]	○ 2 [•]	3 [•]		
8		4 [•]		3 [•]	○ 1 [•]	2 [•]		
9			3 [•]	2 [•]	1 [•] ○			
10			3 [•]	2 [•]	4 [•] 1 [•] ○			
11				3 [•]	○	1 [•] 4 [•]	2 [•]	
12				1 [•]	○ 2 [•]	3 [•]	4 [•]	
13			2 [•]		○	1 [•]	3 [•]	4 [•]
14				1 [•]	○		3 [•]	4 [•] 2 [•] ●
15	○ 3 [•]				○	1 [•]	2 [•]	4 [•]
16			3 [•]	2 [•]	1 [•] ○		4 [•]	
17	○ 1 [•]		3 [•]	2 [•]	○		4 [•]	
18				3 [•]	○ 1 [•]	2 [•]		
19				1 [•]	4 [•] ○	2 [•]	3 [•]	
20			4 [•]	2 [•]	○	1 [•]	3 [•]	
21		4 [•]		1 [•]	2 [•] ○		3 [•]	
22		4 [•]			○ 3 [•]	1 [•]	2 [•]	
23		4 [•]		3 [•]	12 [•] ○			
24		4 [•]	3 [•]	2 [•]	○ 1 [•]			
25		4 [•]		3 [•]	○	2 [•]		1 [•] ●
26			4 [•]	1 [•]	○	3 [•]	2 [•]	
27			2 [•]	4 [•]	○ 1 [•]		3 [•]	
28			1 [•]	2 [•]	○	4 [•]	3 [•]	
29					○ 3 [•]	1 [•]	2 [•]	4 [•]
30	○ 2 [•]		3 [•]	1 [•]	○		4 [•]	
31		3 [•]	2 [•]		○ 1 [•]		4 [•]	

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	0	2		II. Oc. Dis.	11	4	26		I. Tr. Eg.	20	23	24	48.3	I. Ec. Re.					Re. In.
	5	37	27.7	II. Ec. Re.		5	44		I. Sh. Eg.	21	15	52		IV. Tr. In.					In. In.
	8	30		I. Oc. Dis.		16	4		II. Oc. Dis.		17	4		I. Tr. In.					In. In.
	12	7	48.0	I. Ec. Re.		21	34	17.5	II. Ec. Re.		18	17		I. Sh. In.					In. In.
2	2	53		III. Oc. Dis.		23	26		I. Oc. Dis.		19	24		I. Tr. Eg.					Eg. In.
	5	39		I. Tr. In.	19	3	0	46.4	I. Ec. Re.		20	37		I. Sh. Eg.					Eg. In.
	6	33		III. *Oc. Re.		20	36		I. Tr. In.		20	41		IV. Tr. Eg.					Eg. In.
	6	59		I. *Sh. In.		21	4		III. Tr. In.	22	3	9		IV. Sh. In.					In. In.
	7	59		I. Tr. Eg.		21	53		I. Sh. In.		8	5		IV. Sh. Eg.					Eg. In.
	8	19	1.8	III. Ec. Dis.		22	56		I. Tr. Eg.		8	10		II. Oc. Dis.					Dis. In.
	9	19		I. Sh. Eg.	13	0	13		I. Sh. Eg.		13	32	11.8	II. Ec. Re.					Re. In.
	11	52	6.2	III. Ec. Re.		0	45		III. Tr. Eg.		14	23		I. Oc. Dis.					Dis. In.
	19	7		II. Tr. In.		2	14		III. Sh. In.		17	53	35.4	I. Ec. Re.					Re. In.
	21	47		II. Sh. In.		5	1		IV. Oc. Dis.	23	11	34		I. Tr. In.					In. In.
	22	2		II. Tr. Eg.		5	57		III. *Sh. Eg.		12	46		I. Sh. In.					In. In.
3	0	43		II. Sh. Eg.		9	49		IV. Oc. Re.		13	54		I. Tr. Eg.					Eg. In.
	2	59		I. Oc. Dis.		11	6		II. Tr. In.		15	6		I. Sh. Eg.					Eg. In.
	6	36	38.1	I. *Ec. Re.		13	41		II. Sh. In.		15	27		III. Oc. Dis.					Dis. In.
4	0	8		I. Tr. In.		14	1		II. Tr. Eg.		19	8		III. Oc. Re.					Re. In.
	1	28		I. Sh. In.		16	37		II. Sh. Eg.		20	23	37.0	III. Ec. Dis.					Dis. In.
	2	28		I. Tr. Eg.		17	2	18.1	IV. Ec. Dis.		23	56	46.8	III. Ec. Re.					Re. In.
	3	48		I. Sh. Eg.		17	55		I. Oc. Dis.	24	3	9		II. Tr. In.					In. In.
	13	22		II. Oc. Dis.		21	29	34.7	I. Ec. Re.		5	35		II. Sh. In.					In. In.
	18	56	7.1	II. Ec. Re.		21	45	41.7	IV. Ec. Re.		6	4		II. *Tr. Eg.					Eg. In.
	20	46		IV. Tr. In.	14	15	5		I. Tr. In.		8	31		II. Sh. Eg.					Eg. In.
	21	29		I. Oc. Dis.		16	22		I. Sh. In.		8	53		I. Oc. Dis.					Dis. In.
5	1	5	27.7	I. Ec. Re.		17	25		I. Tr. Eg.		12	22	23.4	I. Ec. Re.					Re. In.
	1	32		IV. Tr. Eg.		18	42		I. Sh. Eg.	25	6	4		I. *Tr. In.					Re. In.
	8	56		IV. Sh. In.		15	5		II. Oc. Dis.		7	15		I. Sh. In.					In. In.
	13	51		IV. Sh. Eg.		10	53	52.1	II. Ec. Re.		8	24		I. Tr. Eg.					Eg. In.
	16	55		III. Tr. In.		12	25		I. Oc. Dis.		9	35		I. Sh. Eg.					Eg. In.
	18	38		I. Tr. In.		15	58	22.4	I. Ec. Re.		21	32		II. Oc. Dis.					Dis. In.
	19	57		I. Sh. In.	16	9	35		I. Tr. In.	26	2	50	53.4	II. Ec. Re.					Re. In.
	20	35		III. Tr. Eg.		10	51		I. Sh. In.		3	23		I. Oc. Dis.					Dis. In.
	20	58		I. Tr. Eg.		11	12		III. Oc. Dis.		6	51	9.5	I. *Ec. Re.					Re. In.
	22	13		III. Sh. In.		11	55		I. Tr. Eg.	27	0	34		I. Tr. In.					In. In.
	22	17		I. Sh. Eg.		13	11		I. Sh. Eg.		1	44		I. Sh. In.					In. In.
6	1	56		III. Sh. Eg.		14	53		III. Oc. Re.		2	54		I. Tr. Eg.					Eg. In.
	8	26		II. Tr. In.		16	22	10.3	III. Ec. Dis.		4	4		I. Sh. Eg.					Eg. In.
	11	5		II. Sh. In.		19	55	19.1	III. Ec. Re.		5	34		III. Tr. In.					In. In.
	11	21		II. Tr. Eg.	17	0	27		II. Tr. In.		9	15		III. Tr. Eg.					Eg. In.
	14	1		II. Sh. Eg.		2	59		II. Sh. In.		10	17		III. Sh. In.					In. In.
	15	58		I. Oc. Dis.		3	22		II. Tr. Eg.		14	0		III. Sh. Eg.					Eg. In.
	19	34	18.0	I. Ec. Re.		5	55		II. *Sh. Eg.		16	30		II. Tr. In.					In. In.
7	13	7		I. Tr. In.		6	54		I. *Oc. Dis.		18	53		II. Sh. In.					In. In.
	14	26		I. Sh. In.		10	27	11.2	I. Ec. Re.		19	25		II. Tr. Eg.					Eg. In.
	15	27		I. Tr. Eg.		4	5		I. Tr. In.		21	49		II. Sh. Eg.					Eg. In.
	16	46		I. Sh. Eg.		5	19		I. Sh. In.		21	52		I. Oc. Dis.					Dis. In.
8	2	43		II. Oc. Dis.		6	25		I. *Tr. Eg.	28	1	19	58.9	I. Ec. Re.					Re. In.
	8	15	37.2	II. Ec. Re.		7	39		I. Sh. Eg.		19	4		I. Tr. In.					In. In.
	10	27		I. Oc. Dis.		18	47		II. Oc. Dis.		20	13		I. Sh. In.					In. In.
	14	3	6.2	I. Ec. Re.	19	0	12	33.6	II. Ec. Re.		21	24		I. Tr. Eg.					Eg. In.
9	7	1		III. *Oc. Dis.		1	24		I. Oc. Dis.		22	33		I. Sh. Eg.					Eg. In.
	7	37		I. Tr. In.		4	55	58.1	I. Ec. Re.		10	56		II. Oc. Dis.					Dis. In.
	8	55		I. Sh. In.		22	34		I. Tr. In.		16	10	34.5	II. Ec. Re.					Re. In.
	9	57		I. Tr. Eg.		23	48		I. Sh. In.		16	22		I. Oc. Dis.					Dis. In.
	10	41		III. Oc. Re.	20	0	54		I. Tr. Eg.		19	48	45.4	I. Ec. Re.					Re. In.
	11	15		I. Sh. Eg.		1	17		III. Tr. In.	30	0	27		IV. Oc. Dis.					Dis. In.
	12	20	52.0	III. Ec. Dis.		2	8		I. Sh. Eg.		5	17		IV. Oc. Re.					Re. In.
	15	53	59.4	III. Ec. Re.		4	58		III. Tr. Eg.		11	13	31.5	IV. Ec. Dis.					Dis. In.
	21	46		II. Tr. In.		6	16		III. *Sh. In.		13	34		I. Tr. In.					In. In.
10	0	23		II. Sh. In.		9	59		III. Sh. Eg.		14	42		I. Sh. In.					In. In.
	0	41		II. Tr. Eg.		13	48		II. Tr. In.		15	54		I. Tr. Eg.					Eg. In.
	3	19		II. Sh. Eg.		16	17		II. Sh. In.		15	57	1.7	IV. Ec. Re.					Re. In.
	4	56		I. Oc. Dis.		16	43		II. Tr. Eg.		17	2		I. Sh. Eg.					Eg. In.
	8	31	55.8	I. Ec. Re.		19	13		II. Sh. Eg.		19	44		III. Oc. Dis.					Dis. In.
11	2	6		I. Tr. In.		19	54		I. Oc. Dis.		23	25		III. Oc. Re.					Re. In.
	3	24		I. Sh. In.															





NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite, Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		r	•	III.		d	•	r	•
II.		r	•	IV.		d	•	r	•

Configurations at 6^h 30^m for an Inverting Telescope.

Day.	West.				East.			
1		3	1	○	2		4	
2	○ 1			○	2		4	3 ●
3		2		○	1	3	4	
4		1		○	4	3		
5		4		○	1	2		
6		4	1	○	2			
7		4	3	2	○	1		
8	4	3	1	○	2			
9	4		3	○ 1	2			
10	4		2	○	3			1 ●
11		4	2	1	○	3		
12		4		○	1	2		
13		1	3	4	○	2		
14		3	2		○	1	4	
15		3	1	○		4		2 ●
16			3	○	1	2	4	
17			2	1	○	3	4	
18			2	1	○		3	4
19				○	1	2	3	4
20			1	3	○	2	4	
21		3	2		○	1		
22		3	1	2	○			
23		4	3	○	1	2		
24		4		12	○	3		
25	○ 1	4		2	○		3	
26		4			○	1	2	3
27	○ 3	4		1	○	2		
28		4	3	2	○	1		
29		3	4	1	2	○		
30			3	○	4	1	2	

WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	0	24	32.2	III. Ec. Dis.	11	7	56		I. Sh. Eg.	21	19	36		I. Tr. In.					
	3	57	41.4	III. Ec. Re.		14	15		III. Tr. In.		20	29		I. Sh. In.					
	5	52		II. * Tr. In.		17	57		III. Tr. Eg.		21	56		I. Tr. Eg.					
	8	11		II. Sh. In.		18	22		III. Sh. In.		22	49		I. Sh. Eg.					
	8	47		II. Tr. Eg.		22	0		II. Tr. In.	29	8	51		III. Oc. Dis.					
	10	52		I. Oc. Dis.		22	4		III. Sh. Eg.		14	10		II. Tr. In.					
	11	7		II. Sh. Eg.	19	0	4		II. Sh. In.		15	56		II. Sh. In.					
	14	17	32.2	I. Ec. Re.		0	55		II. Tr. Eg.		16	0	23.1	III. Ec. Re.					
2	8	4		I. Tr. In.		1	52		I. Oc. Dis.		16	53		I. Oc. Dis.					
	9	11		I. Sh. In.		3	0		II. Sh. Eg.		17	6		II. Tr. Eg.					
	10	24		I. Tr. Eg.		5	10	9.0	I. * Ec. Re.		18	53		II. Sh. Eg.					
	11	31		I. Sh. Eg.		23	5		I. Tr. In.		20	2	36.8	I. Ec. Re.					
3	0	19		II. Oc. Dis.	13	0	5		I. Sh. In.	23	14	7		I. Tr. In.					
	5	22		I. * Oc. Dis.		1	25		I. Tr. Eg.		14	58		I. Sh. In.					
	5	29	15.9	II. * Ec. Re.		2	25		I. Sh. Eg.		16	27		I. Tr. Eg.					
	8	46	17.7	I. Ec. Re.		16	32		II. Oc. Dis.		17	18		I. Sh. Eg.					
4	2	34		I. Tr. In.		20	22		I. Oc. Dis.	24	8	47		II. Oc. Dis.					
	3	40		I. Sh. In.		21	27	24.3	II. Ec. Re.		11	23		I. Oc. Dis.					
	4	54		I. Tr. Eg.		23	38	54.3	I. Ec. Re.		13	24	27.0	II. Ec. Re.					
	6	0		I. * Sh. Eg.	14	17	35		I. Tr. In.		14	31	19.7	I. Ec. Re.					
	9	54		III. Tr. In.		18	34		I. Sh. In.	25	7	54		IV. Tr. In.					
	13	35		III. Tr. Eg.		19	55		I. Tr. Eg.		8	37		I. Tr. In.					
	14	20		III. Sh. In.		20	54		I. Sh. Eg.		9	27		I. Sh. In.					
	18	3		III. Sh. Eg.	15	4	26		III. Oc. Dis.		10	57		I. Tr. Eg.					
	19	14		II. Tr. In.		8	8		III. Oc. Re.		11	47		I. Sh. Eg.					
	21	29		II. Sh. In.		8	26	21.2	III. Ec. Dis.		12	47		IV. Tr. Eg.					
	22	9		II. Tr. Eg.		11	23		II. Tr. In.		15	36		IV. Sh. In.					
	23	52		I. Oc. Dis.		11	59	25.2	III. Ec. Re.		20	32		IV. Sh. Eg.					
5	0	25		II. Sh. Eg.		13	21		II. Sh. In.		23	6		III. Tr. In.					
	3	15	5.9	I. Ec. Re.		14	18		II. Tr. Eg.	26	2	25		III. Sh. In.					
	21	4		I. Tr. In.		14	52		I. Oc. Dis.		2	48		III. Tr. Eg.					
	22	9		I. Sh. In.		16	18		II. Sh. Eg.		3	34		II. Tr. In.					
	23	24		I. Tr. Eg.		18	7	39.1	I. Ec. Re.		5	14		II. * Sh. In.					
6	0	29		I. Sh. Eg.	16	12	5		I. Tr. In.		5	53		I. * Oc. Dis.					
	13	44		II. Oc. Dis.		13	3		I. Sh. In.		6	8		III. Sh. Eg.					
	18	22		I. Oc. Dis.		14	25		I. Tr. Eg.		6	30		II. Tr. Eg.					
	18	48	59.1	II. Ec. Re.		15	23		I. Sh. Eg.		8	11		II. Sh. Eg.					
	21	43	51.9	I. Ec. Re.		20	28		IV. Oc. Dis.		9	0	4.4	I. Ec. Re.					
7	15	34		I. Tr. In.	17	1	20		IV. Oc. Re.	27	3	7		I. Tr. In.					
	16	38		I. Sh. In.		5	25	17.0	IV. * Ec. Dis.		3	56		I. Sh. In.					
	17	54		I. Tr. Eg.		5	57		II. * Oc. Dis.		5	27		I. * Tr. Eg.					
	18	58		I. Sh. Eg.		9	22		I. Oc. Dis.		6	16		I. Sh. Eg.					
8	0	4		III. Oc. Dis.		10	8	50.6	IV. Ec. Re.		22	13		II. Oc. Dis.					
	3	45		III. Oc. Re.		10	46	4.0	II. Ec. Re.	28	0	24		I. Oc. Dis.					
	4	25	20.8	III. Ec. Dis.		12	36	23.0	I. Ec. Re.		2	44	11.9	II. Ec. Re.					
	7	58	28.0	III. Ec. Re.	18	6	36		I. Tr. In.		3	28	47.8	I. Ec. Re.					
	8	38		II. Tr. In.		7	32		I. Sh. In.		21	37		I. Tr. In.					
	10	46		II. Sh. In.		8	56		I. Tr. Eg.		22	25		I. Sh. In.					
	11	33		II. Tr. Eg.		9	52		I. Sh. Eg.		23	57		I. Tr. Eg.					
	11	37		IV. Tr. In.		18	40		III. Tr. In.	29	0	45		I. Sh. Eg.					
	12	52		I. Oc. Dis.		22	22		III. Tr. Eg.		13	18		III. Oc. Dis.					
	13	42		II. Sh. Eg.		22	23		III. Sh. In.		16	58		II. Tr. In.					
	16	12	37.4	I. Ec. Re.	19	0	47		II. Tr. In.		18	32		II. Sh. In.					
	16	28		IV. Tr. Eg.		2	6		III. Sh. Eg.		18	54		I. Oc. Dis.					
	21	22		IV. Sh. In.		2	39		II. Sh. In.		19	54		II. Tr. Eg.					
9	2	18		IV. Sh. Eg.		3	42		II. Tr. Eg.		20	1	54.7	III. Ec. Re.					
	10	4		I. Tr. In.		3	53		I. Oc. Dis.		21	29		II. Sh. Eg.					
	11	7		I. Sh. In.		5	36		II. * Sh. Eg.		21	57	30.2	I. Ec. Re.					
	12	24		I. Tr. Eg.		7	5	8.9	I. Ec. Re.	30	16	8		I. Tr. In.					
	13	27		I. Sh. Eg.	20	1	6		I. Tr. In.		16	54		I. Sh. In.					
10	3	7		II. Oc. Dis.		2	0		I. Sh. In.		18	28		I. Tr. Eg.					
	7	22		I. Oc. Dis.		3	26		I. Tr. Eg.		19	14		I. Sh. Eg.					
	8	7	39.9	II. Ec. Re.		4	20		I. Sh. Eg.	31	11	39		II. Oc. Dis.					
	10	41	21.9	I. Ec. Re.		19	22		II. Oc. Dis.		13	24		I. Oc. Dis.					
11	4	34		I. Tr. In.		22	23		I. Oc. Dis.		16	2	47.1	II. Ec. Re.					
	5	36		I. * Sh. In.	21	0	5	48.6	II. Ec. Re.		16	26	12.1	I. Ec. Re.					
	6	54		I. Tr. Eg.		1	33	53.3	I. Ec. Re.										

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

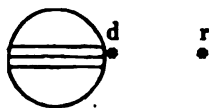
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



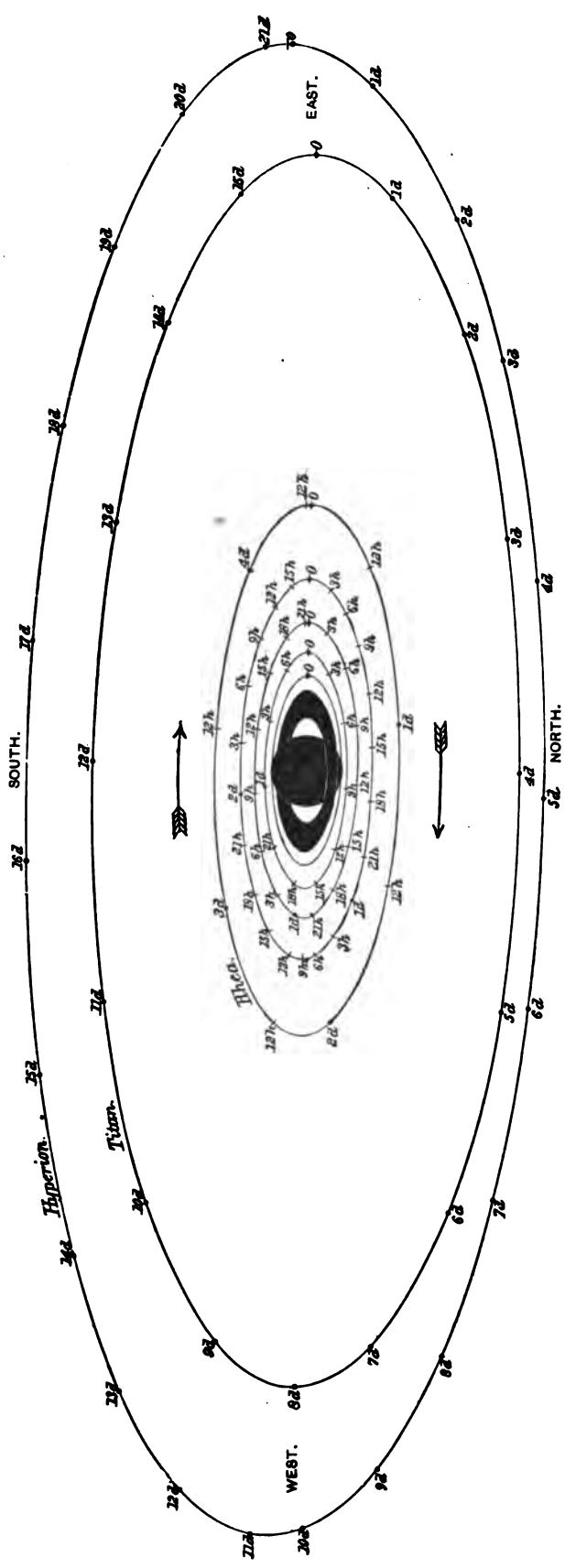
II.



IV.

*Configurations at 5^h 30^m for an Inverting Telescope.*

Day.	West.				East.			
1			·1	○ 2·	·3	·4		
2			·2	○ 1·		·3	·4	
3				○ 2		3·	·4	·1 ●
4				1· ○ 3·	2·		·4	
5			3· 2·	○ 1			4·	
6		3·	·21·	○			4·	
7		·3		○	·1	·2	4·	
8			·1	○ 2·	3·			
9			2· 4·	○ 1·		·3		
10		4·		·1 ○		3·		·2 ●
11	○ 1·	4·		○ 3·	2·			
12		4·		3· 2·	○ 1			
13		·4	3·	·2 1·	○			
14		·4	·3	○	·1 2			
15			·1	○ 2·				·3 ●
16			2· 4	○ 1·	·3			
17			·1 2	○ 4		3·		
18				○ 1·	3· 2·	·4		
19			3· 2·	○		·4		·1 ●
20		3·	·2 1·	○			·4	
21			·3	○	·1 2		4·	
22			1· 3	○ 2·			4·	
23			2·	○ 1·	·3		4·	
24			·1 2	○		4·	·3	
25				○ 4· 1·	2·			
26	○ 2·		4·	·1 ○				
27		4·	3· 2	1· ○				
28		4·	·3	·1 ○	·2			
29		4·		·1 ○	2·			
30		·4		2· ○	·1 3			
31		·4		1· ○		·3		



NAMES OF THE

SATELLITES.

- I. Mimas.
- II. Enceladus.
- III. Tethys.
- IV. Dione.
- V. Rhea.
- VI. Titan.
- VII. Hyperion
- VIII. Japetus.

MEAN SYNODIC

PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1890,

AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can only be seen within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I, Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible at Washington.

Jan. 1 13.2 E.	Jan. 28 9.6 W.	Feb. 26 14.7 W.	Mar. 31 14.2 W.	May 5 11.0 W.	Nov. 23 16.0 E.
2 11.8 E.	Feb. 1 15.5 E.	27 13.3 W.	Apr. 1 12.8 W.	6 9.6 W.	24 14.6 E.
3 10.4 E.	2 14.1 E.	28 11.9 W.	2 11.4 W.	7 8.2 W.	30 17.8 W.
7 16.1 W.	3 12.7 E.	Mar. 1 10.5 W.	3 10.0 W.	12 12.6 E.	Dec. 1 16.4 W.
8 14.7 W.	4 11.3 E.	6 14.9 E.	8 14.4 E.	13 11.2 E.	2 15.0 W.
9 13.3 W.	5 9.9 E.	7 13.5 E.	9 13.0 E.	14 9.8 E.	3 13.6 W.
10 11.9 W.	9 15.6 W.	8 12.1 E.	10 11.6 E.	21 11.5 W.	9 16.7 E.
11 10.5 W.	10 14.2 W.	9 10.7 E.	11 10.2 E.	22 10.1 W.	10 15.3 E.
15 16.3 E.	11 12.8 W.	10 9.3 E.	12 8.8 E.	23 8.7 W.	11 13.9 E.
16 14.9 E.	12 11.4 W.	14 15.2 W.	17 13.3 W.	29 11.9 E.	17 17.0 W.
17 13.6 E.	13 10.0 W.	15 13.8 W.	18 11.9 W.	30 10.5 E.	18 15.6 W.
18 12.1 E.	17 15.8 E.	16 12.4 W.	19 10.5 W.	31 9.1 E.	19 14.2 W.
19 10.7 E.	18 14.4 E.	17 11.0 W.	20 9.1 W.	June 7 10.9 W.	20 12.8 W.
23 16.6 W.	19 13.0 E.	18 9.6 W.	26 12.2 E.	8 9.5 W.	25 17.3 E.
24 15.2 W.	20 11.6 E.	23 14.0 E.	27 10.8 E.	Nov. 14 16.8 W.	26 1.9 E.
25 13.8 W.	21 10.2 E.	24 12.6 E.	28 9.4 E.	15 15.4 W.	27 14.5 E.
26 12.4 W.	22 8.8 E.	25 11.2 E.	29 8.0 E.	16 14.0 W.	28 13.1 E.
27 11.0 W.	25 16.1 W.	26 9.8 E.	May 4 12.4 W.	22 17.4 E.	29 11.7 E.

ENCELADUS.

Jan. 1 19.2 E.	Jan. 15 11.9 E.	Jan. 29 4.5 E.	Feb. 11 21.3 E.	Feb. 25 14.0 E.	Mar. 11 6.8 E.
3 4.1 E.	16 20.7 E.	30 13.4 E.	13 6.2 E.	26 22.9 E.	12 15.6 E.
4 13.0 E.	18 5.6 E.	31 22.4 E.	14 15.1 E.	28 7.8 E.	14 9.6 E.
5 21.9 E.	19 14.5 E.	Feb. 2 7.3 E.	16 0.0 E.	Mar. 1 16.7 E.	15 0.5 E.
7 6.8 E.	20 23.3 E.	3 16.1 E.	17 8.8 E.	3 1.5 E.	16 18.3 E.
8 15.7 E.	22 8.2 E.	5 1.0 E.	18 17.7 E.	4 10.4 E.	18 3.2 E.
10 0.6 E.	23 17.1 E.	6 9.9 E.	20 2.6 E.	5 19.3 E.	19 12.1 E.
11 9.3 E.	25 1.9 E.	7 18.7 E.	21 11.4 E.	7 4.2 E.	20 20.9 E.
12 18.2 E.	26 10.8 E.	9 3.6 E.	22 20.3 E.	8 13.1 E.	22 5.8 E.
14 3.0 E.	27 19.6 E.	10 12.5 E.	24 5.1 E.	9 21.9 E.	23 14.6 E.

WASHINGTON MEAN TIMES OF GREATEST ELONGATIONS.

ENCELADUS—(Concluded.)

Mar.	d	h	Apr.	d	h	May	d	h	May	d	h	Nov.	d	h	Dec.	d	h																																																																																																																																																																																					
	24	23.6 E.		26	8.5 E.		27	17.5 E.		29	2.4 E.		30	11.2 E.		14	12.9 E.	5	2.1 E.	25	15.4 E.	22	14.2 E.	13	3.6 E.			15	21.8 E.	6	11.0 E.	27	0.3 E.	23	23.1 E.	14	12.4 E.			17	6.6 E.	7	19.9 E.	28	9.3 E.	25	7.9 E.	15	21.2 E.			18	15.5 E.	9	4.8 E.	29	18.2 E.	26	16.8 E.	17	6.1 E.			20	0.3 E.	10	13.6 E.	31	3.0 E.	28	1.7 E.	18	15.0 E.	Apr.	31	20.1 E.	21	9.2 E.	11	22.5 E.	Nov.	8	21.2 E.	29	10.7 E.	19	23.9 E.	2	5.0 E.	22	18.1 E.	13	7.4 E.	10	6.1 E.	30	19.6 E.	21	8.8 E.	3	13.8 E.	24	3.1 E.	14	16.2 E.	11	14.9 E.	Dec.	2	4.4 E.	22	17.6 E.	4	22.7 E.	25	12.0 E.	16	1.2 E.	12	23.8 E.	3	13.3 E.	24	2.5 E.	6	7.5 E.	26	20.8 E.	17	10.0 E.	14	8.7 E.	4	22.2 E.	25	11.4 E.			28	5.7 E.	18	18.9 E.	15	17.7 E.	6	7.1 E.	26	20.4 E.			29	14.6 E.	20	3.8 E.	17	2.6 E.	7	16.0 E.	28	5.3 E.			30	23.5 E.	21	12.7 E.	18	11.4 E.	9	0.8 E.	29	14.2 E.			May	2	8.4 E.	22	21.6 E.	19	20.3 E.	10	9.7 E.	30	23.0 E.				3	17.2 E.	24	6.4 E.	21	5.2 E.	11	18.6 E.	32	7.9 E.
	26	8.5 E.		27	17.5 E.		29	2.4 E.		30	11.2 E.		14	12.9 E.		5	2.1 E.	25	15.4 E.	22	14.2 E.	13	3.6 E.			15	21.8 E.	6	11.0 E.	27	0.3 E.	23	23.1 E.	14	12.4 E.			17	6.6 E.	7	19.9 E.	28	9.3 E.	25	7.9 E.	15	21.2 E.			18	15.5 E.	9	4.8 E.	29	18.2 E.	26	16.8 E.	17	6.1 E.			20	0.3 E.	10	13.6 E.	31	3.0 E.	28	1.7 E.	18	15.0 E.	Apr.	31		20.1 E.	21	9.2 E.	11	22.5 E.	Nov.		8	21.2 E.	29	10.7 E.	19	23.9 E.	2	5.0 E.	22	18.1 E.	13	7.4 E.	10	6.1 E.	30	19.6 E.	21	8.8 E.	3	13.8 E.	24	3.1 E.	14	16.2 E.	11	14.9 E.	Dec.	2	4.4 E.	22	17.6 E.	4	22.7 E.	25	12.0 E.	16	1.2 E.	12	23.8 E.	3	13.3 E.	24	2.5 E.	6	7.5 E.	26	20.8 E.	17	10.0 E.	14	8.7 E.	4	22.2 E.	25	11.4 E.			28	5.7 E.	18	18.9 E.	15	17.7 E.	6	7.1 E.	26	20.4 E.			29	14.6 E.	20	3.8 E.	17	2.6 E.	7	16.0 E.	28	5.3 E.			30	23.5 E.	21	12.7 E.	18	11.4 E.	9	0.8 E.	29	14.2 E.			May	2	8.4 E.	22	21.6 E.	19	20.3 E.	10	9.7 E.	30	23.0 E.				3	17.2 E.	24	6.4 E.	21	5.2 E.	11	18.6 E.	32	7.9 E.
	27	17.5 E.		29	2.4 E.		30	11.2 E.		14	12.9 E.		5	2.1 E.		25	15.4 E.	22	14.2 E.	13	3.6 E.			15	21.8 E.	6	11.0 E.	27	0.3 E.	23	23.1 E.	14	12.4 E.			17	6.6 E.	7	19.9 E.	28	9.3 E.	25	7.9 E.	15	21.2 E.			18	15.5 E.	9	4.8 E.	29	18.2 E.	26	16.8 E.	17	6.1 E.			20	0.3 E.	10	13.6 E.	31	3.0 E.	28	1.7 E.	18	15.0 E.	Apr.	31		20.1 E.		21	9.2 E.	11	22.5 E.	Nov.			8	21.2 E.	29	10.7 E.	19	23.9 E.	2	5.0 E.	22	18.1 E.	13	7.4 E.	10	6.1 E.	30	19.6 E.	21	8.8 E.	3	13.8 E.	24	3.1 E.	14	16.2 E.	11	14.9 E.	Dec.	2	4.4 E.	22	17.6 E.	4	22.7 E.	25	12.0 E.	16	1.2 E.	12	23.8 E.	3	13.3 E.	24	2.5 E.	6	7.5 E.	26	20.8 E.	17	10.0 E.	14	8.7 E.	4	22.2 E.	25	11.4 E.			28	5.7 E.	18	18.9 E.	15	17.7 E.	6	7.1 E.	26	20.4 E.			29	14.6 E.	20	3.8 E.	17	2.6 E.	7	16.0 E.	28	5.3 E.			30	23.5 E.	21	12.7 E.	18	11.4 E.	9	0.8 E.	29	14.2 E.			May	2	8.4 E.	22	21.6 E.	19	20.3 E.	10	9.7 E.	30	23.0 E.				3	17.2 E.	24	6.4 E.	21	5.2 E.	11	18.6 E.	32	7.9 E.
	29	2.4 E.																																																																																																																																																																																																				
30	11.2 E.	14	12.9 E.	5	2.1 E.	25	15.4 E.	22	14.2 E.	13	3.6 E.																																																																																																																																																																																											
		15	21.8 E.	6	11.0 E.	27	0.3 E.	23	23.1 E.	14	12.4 E.																																																																																																																																																																																											
		17	6.6 E.	7	19.9 E.	28	9.3 E.	25	7.9 E.	15	21.2 E.																																																																																																																																																																																											
		18	15.5 E.	9	4.8 E.	29	18.2 E.	26	16.8 E.	17	6.1 E.																																																																																																																																																																																											
		20	0.3 E.	10	13.6 E.	31	3.0 E.	28	1.7 E.	18	15.0 E.																																																																																																																																																																																											
Apr.	31	20.1 E.	21	9.2 E.	11	22.5 E.	Nov.	8	21.2 E.	29	10.7 E.	19	23.9 E.																																																																																																																																																																																									
	2	5.0 E.	22	18.1 E.	13	7.4 E.		10	6.1 E.	30	19.6 E.	21	8.8 E.																																																																																																																																																																																									
	3	13.8 E.	24	3.1 E.	14	16.2 E.		11	14.9 E.	Dec.	2	4.4 E.	22	17.6 E.																																																																																																																																																																																								
	4	22.7 E.	25	12.0 E.	16	1.2 E.		12	23.8 E.	3	13.3 E.	24	2.5 E.																																																																																																																																																																																									
	6	7.5 E.	26	20.8 E.	17	10.0 E.		14	8.7 E.	4	22.2 E.	25	11.4 E.																																																																																																																																																																																									
		28	5.7 E.	18	18.9 E.	15	17.7 E.	6	7.1 E.	26	20.4 E.																																																																																																																																																																																											
		29	14.6 E.	20	3.8 E.	17	2.6 E.	7	16.0 E.	28	5.3 E.																																																																																																																																																																																											
		30	23.5 E.	21	12.7 E.	18	11.4 E.	9	0.8 E.	29	14.2 E.																																																																																																																																																																																											
		May	2	8.4 E.	22	21.6 E.	19	20.3 E.	10	9.7 E.	30	23.0 E.																																																																																																																																																																																										
			3	17.2 E.	24	6.4 E.	21	5.2 E.	11	18.6 E.	32	7.9 E.																																																																																																																																																																																										

TETHYS.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	June	d h	Nov.	d h
	2 3.0 E.	8 20.7 E.	18 14.5 E.	25 8.3 E.	2 2.8 E.	26 16.1 E.					
	4 0.3 E.	10 18.0 E.	20 11.8 E.	27 5.7 E.	4 0.1 E.	28 13.4 E.					
	5 21.6 E.	12 15.3 E.	22 9.1 E.	29 3.0 E.	5 21.4 E.	30 10.7 E.					
	7 18.9 E.	14 12.6 E.	24 6.4 E.	May	1 0.3 E.	7 18.7 E.	Dec.	2 8.0 E.			
	9 16.2 E.	16 9.9 E.	26 3.7 E.		2 21.6 E.	4 5.3 E.					
	11 13.5 E.	18 7.1 E.	28 1.0 E.	4 19.0 E.	Oct.	29 8.2 E.	6 2.6 E.				
	13 10.8 E.	20 4.4 E.	29 22.3 E.	6 16.3 E.	31 5.5 E.	7 23.9 E.					
	15 8.1 E.	22 1.7 E.	31 19.6 E.	8 13.6 E.	Nov.	2 2.8 E.	9 21.3 E.				
	17 5.4 E.	23 23.0 E.	Apr.	10 10.9 E.		4 0.1 E.	11 18.6 E.				
19 2.6 E.	25 20.2 E.	4 14.1 E.		12 8.2 E.	5 21.4 E.	13 15.9 E.					
Feb.	20 23.9 E.	27 17.5 E.	6 11.4 E.	14 5.5 E.	7 18.8 E.	15 13.2 E.					
	22 21.3 E.	Mar.	8 8.7 E.	16 2.9 E.	9 16.3 E.	17 10.6 E.					
	24 18.5 E.		3 12.1 E.	10 6.0 E.	11 13.6 E.	19 7.9 E.					
	26 15.8 E.		5 9.4 E.	12 3.3 E.	13 10.9 E.	21 5.2 E.					
	28 13.1 E.		7 6.7 E.	14 0.6 E.	15 8.1 E.	23 2.5 E.					
	30 10.3 E.	9 4.0 E.	15 21.9 E.	23 16.2 E.	17 5.5 E.	24 23.8 E.					
	1 7.6 E.	11 1.3 E.	17 19.2 E.	25 13.5 E.	19 2.8 E.	26 21.1 E.					
	3 4.8 E.	12 22.5 E.	19 16.4 E.	27 10.9 E.	21 0.1 E.	28 18.4 E.					
	5 2.1 E.	14 19.8 E.	21 13.7 E.	29 8.2 E.	22 21.4 E.	30 15.7 E.					
	6 23.4 E.	16 17.2 E.	23 11.0 E.	31 5.5 E.	24 18.8 E.	32 13.0 E.					

DIONE.

Jan.	d h 1 4.6 E. 3 22.3 E. 6 16.0 E. 9 9.6 E. 12 3.3 E. 14 20.9 E. 17 14.6 E. 20 8.2 E. 23 1.9 E. 25 19.5 E. 28 13.2 E. 31 6.7 E.	Feb.	d h 3 0.4 E. 5 17.9 E. 8 11.6 E. 11 5.2 E. 13 22.9 E. 16 16.5 E. 19 10.2 E. 22 3.8 E. 24 21.5 E. 27 15.1 E. Mar. 2 8.8 E. 5 2.4 E.	Mar.	d h 7 20.1 E. 10 13.7 E. 13 7.4 E. 16 0.9 E. 18 18.7 E. 21 12.3 E. 24 5.9 E. 26 23.6 E. 29 17.3 E. Apr. 1 11.0 E. 4 4.6 E. 6 22.3 E.	Apr.	d h 9 15.9 E. 12 9.6 E. 15 3.2 E. 17 20.9 E. 20 14.6 E. 23 8.3 E. 26 1.9 E. 28 19.6 E. May 1 13.3 E. 4 7.0 E. 7 0.7 E. 9 18.4 E.	May	d h 12 12.1 E. 15 5.8 E. 17 23.6 E. 20 17.3 E. 23 10.9 E. Nov. 12 0.8 E. 14 18.5 E. 17 12.1 E. 20 5.8 E. 22 23.5 E. 25 17.2 E. 28 11.0 E.	Dec.	d h 1 4.7 E. 3 22.4 E. 6 16.1 E. 9 9.8 E. 12 3.5 E. 14 21.2 E. 17 14.9 E. 20 8.6 E. 23 2.3 E. 25 20.1 E. 28 13.7 E. 31 7.3 E.
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RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 3	12.1 E.	Apr. 21	19.7 E.	Jan. 3	8.1 I.	Apr. 8	16.6 I.	Jan. 2	0.4 I.	May 9	22.6 I.
8	0.5 E.	26	8.1 E.	7	7.6 W.	12	16.1 W.	7	8.4 W.	15	6.5 W.
12	12.8 E.	30	20.6 E.	11	7.0 S.	16	15.6 S.	12	16.3 S.	20	14.4 S.
17	1.1 E.	May 5	9.0 E.	15	6.4 E.	20	15.3 E.	18	0.2 E.	25	22.5 E.
21	13.5 E.	9	21.4 E.	19	5.8 I.	24	15.0 I.	23	8.1 I.	31	6.4 I.
26	1.8 E.	14	10.0 E.	23	5.2 W.	28	14.6 W.	28	16.0 W.	June 5	14.3 W.
30	14.0 E.	18	22.5 E.	27	4.6 S.	May 2	14.2 S.	Feb. 3	0.0 S.	10	22.2 S.
Feb. 4	2.3 E.	23	10.9 E.	31	4.0 E.	6	13.9 E.	8	7.7 E.	16	6.4 E.
8	14.7 E.	27	23.5 E.	Feb. 4	3.3 I.	10	13.7 I.	13	15.5 I.	21	14.3 I.
13	2.9 E.	June 1	12.4 E.	8	2.5 W.	14	13.5 W.	18	23.3 W.	26	22.3 W.
17	15.2 E.	Nov. 2	7.5 E.	12	1.8 S.	Nov. 10	19.2 S.	24	7.3 S.	Oct. 20	23.1 E.
22	3.5 E.	6	20.1 E.	16	1.1 E.	14	19.2 E.	Mar. 1	15.4 E.	26	7.3 I.
26	15.7 E.	11	8.6 E.	20	0.4 I.	18	19.1 I.	6	23.2 I.	31	15.4 W.
Mar. 3	4.0 E.	15	21.2 E.	23	23.6 W.	22	19.1 W.	12	7.0 W.	Nov. 5	23.6 S.
7	16.4 E.	20	9.7 E.	27	22.8 S.	26	19.0 S.	17	15.1 S.	11	7.5 E.
12	4.6 E.	24	22.2 E.	Mar. 3	22.1 E.	30	19.0 E.	22	23.1 E.	16	15.4 I.
16	17.0 E.	29	10.7 E.	7	21.4 I.	Dec. 4	18.8 I.	28	6.9 I.	21	23.5 W.
21	5.4 E.	Dec. 3	23.2 E.	11	20.7 W.	8	18.6 W.	Apr. 2	14.8 W.	27	7.5 S.
25	17.7 E.	8	11.6 E.	15	20.0 S.	12	18.4 S.	7	22.8 S.	Dec. 2	15.4 E.
30	6.0 E.	13	0.0 E.	19	19.4 E.	16	18.3 E.	13	6.9 E.	7	23.3 I.
Apr. 3	18.4 E.	17	12.5 E.	23	18.8 I.	20	18.0 I.	18	14.7 I.	13	7.3 W.
8	6.6 E.	22	0.9 E.	27	18.2 W.	24	17.8 W.	23	22.6 W.	18	15.3 S.
12	19.0 E.	26	13.4 E.	31	17.7 S.	28	17.6 S.	29	6.6 S.	23	23.2 E.
17	7.4 E.	31	1.7 E.	Apr. 4	17.1 E.	32	17.5 E.	May 4	14.7 E.	29	7.1 I.

JAPETUS	West Elongation	January 3	March 21	June 9	August 29	November 18
	Superior Conjunction	January 22	April 10	June 29	September 18	December 8
	East Elongation	February 10	April 30	July 19	October 9	December 28
	Inferior Conjunction	March 2	May 20	August 9	October 29	

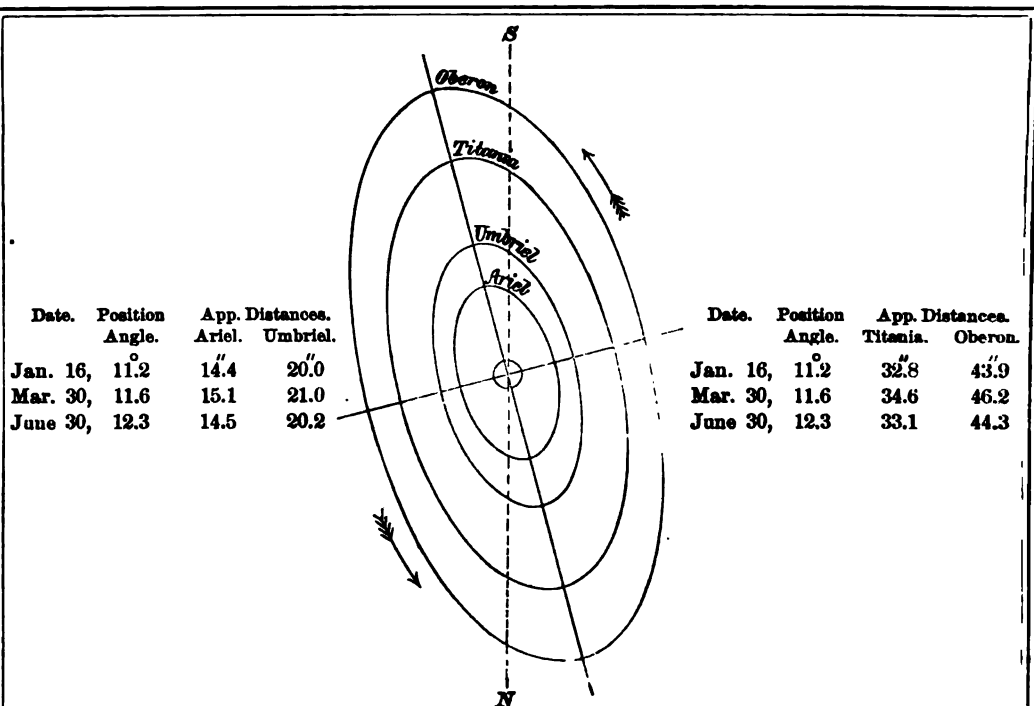
THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.	a	b	p	l	l'	s	s'
	Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	The Elevation of the Earth above the Plane of the Ring.	The Elevation of the Sun above the Plane of the Ring.	Earth's Longitude from Saturn counted on Plane of Ring from the Ring's As- cending Node on	
						Equator.	Ecliptic.
Jan. 0	43.50	6.16	— 6° 9.4	— 8° 8.1	— 10° 17.4	210° 30.6	167° 58.5
20	44.66	6.91	— 6 14.9	— 8 53.9	— 9 59.4	209 12.5	166 40.2
Feb. 9	45.31	7.53	— 6 20.0	— 9 33.7	— 9 41.3	208 2.1	165 29.9
Mar. 1	45.29	7.96	— 6 24.3	— 10 7.0	— 9 23.2	207 0.5	164 28.3
21	44.63	8.15	— 6 28.1	— 10 31.4	— 9 5.0	206 6.1	163 33.8
Apr. 10	43.46	8.22	— 6 31.2	— 10 54.2	— 8 46.8	205 15.3	162 43.1
30	41.85	8.20	— 6 33.7	— 11 15.3	— 8 28.6	204 34.4	162 2.4
May 20	40.53	7.95	— 6 32.1	— 11 18.5	— 8 10.3	205 4.5	162 33.1
June 9	39.15	7.31	— 6 28.4	— 10 46.1	— 7 52.0	205 57.2	163 26.0
29	38.00	6.45	— 6 22.7	— 9 45.9	— 7 33.6	207 19.8	164 48.3
July 19	37.13	5.65	— 6 14.7	— 8 44.8	— 7 15.2	209 22.3	166 50.7
Aug. 8	36.59	4.89	— 6 5.6	— 7 41.1	— 6 56.7	211 25.7	168 54.1
28	36.37	4.17	— 5 55.7	— 6 35.2	— 6 38.2	213 30.0	170 58.4
Sept. 17	36.51	3.50	— 5 45.0	— 5 30.5	— 6 19.7	215 34.8	173 3.3
Oct. 7	36.98	2.87	— 5 34.9	— 4 27.0	— 6 1.2	217 39.9	175 8.3
27	37.79	2.27	— 5 25.5	— 3 24.7	— 5 42.6	219 45.3	177 14.0
Nov. 16	38.90	1.84	— 5 18.4	— 2 42.6	— 5 24.0	221 25.9	178 54.8
Dec. 6	40.24	1.62	— 5 13.0	— 2 18.2	— 5 5.4	222 30.6	179 59.6
26	41.71	1.55	— 5 10.6	— 2 7.5	— 4 46.9	222 39.6	180 8.4
31	42.07	1.58	— 5 10.7	— 2 9.0	— 4 42.2	222 39.7	180 8.0

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring	= 0.8801	log factor = 9.9445
The outer ellipse of the inner ring	= 0.8509	log factor = 9.9344
The inner ellipse of the inner ring	= 0.6650	log factor = 9.8228
The inner ellipse of the dusky ring	= 0.5486	log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.

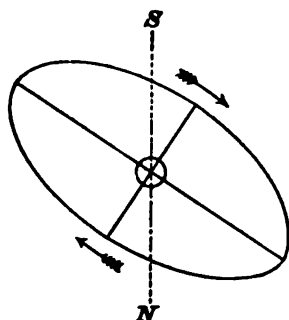


APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1890,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Jan. 16 9.2	Jan. 20 3.9	Jan. 18 1.5	Jan. 15 23.8	Jan. 12 1.9	Jan. 16 10.4	Jan. 12 22.6 S.
23 22.6	27 17.4	26 8.4	24 6.7	20 18.9	25 3.3	19 16.2 N.
31 12.1	Feb. 4 6.8	Feb. 3 15.3	Feb. 1 13.6	29 11.8	Feb. 2 20.3	26 9.7 S.
Feb. 8 1.6	11 20.3	11 22.2	9 20.5	Feb. 7 4.7	11 13.2	Feb. 2 3.3 N.
15 15.0	19 9.7	20 5.2	18 3.4	15 21.7	20 6.2	8 20.9 S.
23 4.5	26 23.2	28 12.1	26 10.3	24 14.6	28 23.1	15 14.4 N.
Mar. 2 17.9	Mar. 6 12.7	Mar. 8 19.0	Mar. 6 17.2	Mar. 5 7.6	Mar. 9 16.1	22 8.0 S.
10 7.4	14 2.1	17 1.9	15 0.1	14 0.5	18 9.0	Mar. 1 1.6 N.
17 20.8	21 15.6	25 8.8	23 7.0	22 17.5	27 2.0	7 19.2 S.
25 10.3	29 5.0	Apr. 2 15.7	31 14.0	31 10.5	Apr. 4 18.9	14 12.7 N.
Apr. 1 23.8	Apr. 5 18.5	10 22.6	Apr. 8 20.9	Apr. 9 3.4	13 11.9	21 6.3 S.
9 13.2	13 7.9	19 5.6	17 3.8	17 20.4	22 4.8	27 23.9 N.
17 2.7	20 21.4	27 12.5	25 10.8	26 13.3	30 21.8	Apr. 3 17.5 S.
24 16.2	28 10.9	May 5 19.5	May 3 17.7	May 5 6.3	May 9 14.8	10 11.1 N.
May 2 5.6	May 6 0.4	14 2.4	12 0.6	13 23.3	18 7.7	17 4.6 S.
9 19.1	13 13.9	22 9.3	20 7.6	22 16.2	27 0.7	23 22.2 N.
17 8.6	21 3.4	30 16.3	28 14.5	31 9.2	June 4 17.7	30 15.8 S.
24 22.1	28 16.9	June 7 23.2	June 5 21.5	June 9 2.2	13 10.7	May 7 9.3 N.
June 1 11.6	June 5 6.3	16 6.2	14 4.4	17 19.2	22 3.7	14 2.9 S.
9 1.1	12 19.8	24 13.1	22 11.4	26 12.2	30 20.7	20 20.5 N.
16 14.6	20 9.3	July 2 20.1	30 18.4	July 5 5.2	July 9 13.7	27 14.1 S.
24 4.1	27 22.8	11 3.0	July 9 1.3	13 22.3	18 6.7	June 3 7.7 N.
July 1 17.6	July 5 12.3	19 10.0	17 8.3	22 15.3	26 23.7	10 1.3 S.
9 7.1	13 1.8	27 17.0	25 15.2	31 8.4	Aug. 4 16.7	16 18.9 N.
16 20.6	20 15.4	Aug. 4 23.9	Aug. 2 22.1	Aug. 9 1.4	13 9.8	23 12.5 S.
Period of Ariel, 2 12.489		Period of Titania, 8 16.942		Period of Oberon, 13 11.119		
Period of Umbriel, 4 3.460						

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle.	Apparent Distance.
Jan. 29,	237.6°	16.6"
Oct. 8,	241.5	16.8
Nov. 24,	240.8	16.8

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1890,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

North East.		South West.		North East.		South West.		North East.		South West.	
Jan.	d h	Jan.	d h	Aug.	d h	Sept.	d h	Oct.	d h	Nov.	d h
	2 15.8		5 14.3		31 12.3		3 10.9		29 7.4		1 6.0
	8 12.9		11 11.4	Sept.	6 9.4		9 8.0		4 4.6		7 3.1
	14 9.9		17 8.5		12 6.6		15 5.1		10 1.7		13 0.2
	20 7.0		23 5.5		18 3.7		21 2.2		15 22.8		18 21.3
	26 4.1		29 2.6		24 0.9		26 23.3		21 19.9		24 18.5
Feb.	1 1.2	Feb.	3 23.7		29 21.9	Oct.	2 20.4		27 17.0		30 15.6
	6 22.2		9 20.8	Oct.	5 19.0		8 17.6		3 14.1	Dec.	6 12.7
	12 19.3		15 17.8		11 16.1		14 14.7		9 11.2		12 9.8
	18 16.4		21 14.9		17 13.2		20 11.8		15 8.4		18 6.9
	24 13.4		27 12.0		23 10.3		26 8.9		21 5.5		24 4.0
Mar.	2 10.5	Mar.	5 9.0						27 2.6		30 1.1

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, 5^d 21^h.045.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

Jan.	d	h	m							Apr.	d	h	m						
	1	14	-	⊕	in Perihelion.					8	19	23		♂	♂	♂	♂	♂	♂
	1	15	43	♂	♂	♂	♂	♂	♂	12	20	3		♂	♂	♂	♂	♂	♂
	1	22	-	♂	♂	♂	♂	♂	♂	13	10	22		♂	♂	♂	♂	♂	♂
	9	9	47	♂	♂	♂	♂	♂	♂	14	0	-		♂	♂	♂	♂	♂	♂
	9	12	39	♂	♂	♂	♂	♂	♂	18	0	-		♂	♂	♂	♂	♂	♂
	13	8	-	♂	♂	♂	♂	♂	♂	19	11	9		♂	♂	♂	♂	♂	♂
	13	14	54	♂	♂	♂	♂	♂	♂	19	18	51		♂	♂	♂	♂	♂	♂
	14	12	24	♂	♂	♂	♂	♂	♂	21	4	52		♂	♂	♂	♂	♂	♂
	15	11	8	♂	♂	♂	♂	♂	♂	22	7	-		♂	♂	♂	♂	♂	♂
	16	2	-	♂	♂	♂	♂	♂	♂	23	1	12		♂	♂	♂	♂	♂	♂
	18	16	12	♂	♂	♂	♂	♂	♂	25	1	20		♂	♂	♂	♂	♂	♂
	19	15	-	♂	♂	♂	♂	♂	♂	25	11	2		♂	♂	♂	♂	♂	♂
	19	16	47	♂	♂	♂	♂	♂	♂	28	2	11		♂	♂	♂	♂	♂	♂
	19	18	33	♂	♂	♂	♂	♂	♂	28	7	45		♂	♂	♂	♂	♂	♂
	20	1	-	♂	♂	♂	♂	♂	♂	28	8	-		♂	♂	♂	♂	♂	♂
	21	4	38	♂	♂	♂	♂	♂	♂	30	13	-		♂	♂	♂	♂	♂	♂
	29	0	34	♂	♂	♂	♂	♂	♂	May	2	13	15		♂	♂	♂	♂	♂
	29	1	4	♂	♂	♂	♂	♂	♂	3	4	36		♂	♂	♂	♂	♂	♂
	30	4	-	♂	♂	♂	♂	♂	♂	4	16	-		♂	♂	♂	♂	♂	♂
	30	8	33	♂	♂	♂	♂	♂	♂	5	20	-		♂	♂	♂	♂	♂	♂
Feb.	5	7	-	♂	♂	♂	♂	♂	♂	6	3	8		♂	♂	♂	♂	♂	♂
	5	12	29	♂	♂	♂	♂	♂	♂	9	14	-		♂	♂	♂	♂	♂	♂
	9	6	-	♂	♂	♂	♂	♂	♂	10	5	48		♂	♂	♂	♂	♂	♂
	9	19	-	♂	♂	♂	♂	♂	♂	17	16	-		♂	♂	♂	♂	♂	♂
	9	21	14	♂	♂	♂	♂	♂	♂	18	5	-		♂	♂	♂	♂	♂	♂
	10	11	-	♂	♂	♂	♂	♂	♂	18	14	54		♂	♂	♂	♂	♂	♂
	11	22	-	♂	♂	♂	♂	♂	♂	19	7	25		♂	♂	♂	♂	♂	♂
	16	13	21	♂	♂	♂	♂	♂	♂	20	3	1		♂	♂	♂	♂	♂	♂
	16	19	42	♂	♂	♂	♂	♂	♂	21	19	7		♂	♂	♂	♂	♂	♂
	17	17	55	♂	♂	♂	♂	♂	♂	24	20	-		♂	♂	♂	♂	♂	♂
	18	11	-	♂	♂	♂	♂	♂	♂	25	11	22		♂	♂	♂	♂	♂	♂
	18	15	45	♂	♂	♂	♂	♂	♂	27	2	9		♂	♂	♂	♂	♂	♂
	19	17	-	♂	♂	♂	♂	♂	♂	28	14	-		♂	♂	♂	♂	♂	♂
	22	19	52	♂	♂	♂	♂	♂	♂	29	12	7		♂	♂	♂	♂	♂	♂
	23	5	-	♂	♂	♂	♂	♂	♂	29	20	56		♂	♂	♂	♂	♂	♂
	25	8	34	♂	♂	♂	♂	♂	♂	30	14	-		♂	♂	♂	♂	♂	♂
	27	19	-	♂	♂	♂	♂	♂	♂	June	1	0	-		♂	♂	♂	♂	♂
Mar.	4	11	-	♂	♂	♂	♂	♂	♂	1	23	32		♂	♂	♂	♂	♂	♂
	4	15	3	♂	♂	♂	♂	♂	♂	4	14	-		♂	♂	♂	♂	♂	♂
	5	1	-	♂	♂	♂	♂	♂	♂	6	13	9		♂	♂	♂	♂	♂	♂
	9	1	42	♂	♂	♂	♂	♂	♂	9	21	-		♂	♂	♂	♂	♂	♂
	12	2	13	♂	♂	♂	♂	♂	♂	10	15	-		♂	♂	♂	♂	♂	♂
	16	7	1	♂	♂	♂	♂	♂	♂	14	19	38		♂	♂	♂	♂	♂	♂
	18	17	24	♂	♂	♂	♂	♂	♂	15	0	35		♂	♂	♂	♂	♂	♂
	19	22	25	♂	♂	♂	♂	♂	♂	16	-	-		♂	♂	♂	♂	♂	♂
	20	14	48	♂	♂	♂	♂	♂	♂	19	10	56		♂	♂	♂	♂	♂	♂
	24	18	16	♂	♂	♂	♂	♂	♂	19	11	40		♂	♂	♂	♂	♂	♂
	25	10	22	♂	♂	♂	♂	♂	♂	20	18	39		♂	♂	♂	♂	♂	♂
	31	20	20	♂	♂	♂	♂	♂	♂	21	9	37		♂	♂	♂	♂	♂	♂
Apr.	5	6	49	♂	♂	♂	♂	♂	♂	21	22	11		♂	♂	♂	♂	♂	♂
	8	14	14	♂	♂	♂	♂	♂	♂	23	13	-		♂	♂	♂	♂	♂	♂

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ .	Longitude	
				From Washington.	From Greenwich.
				^h ^m ^s	^h ^m ^s
Åbo	+ 60° 26' 56.8	— 9' 53.5	9.998902	— 6 37 18.45	— 1 29 6.41
Adelaide	— 34 55 33.8	+ 10 47.6	9.999527	— 14 22 32.34	— 9 14 20.30
Albany	+ 42 39 49.5	— 11 28.2	9.999336	— 0 13 12.39	+ 4 54 59.65
Alfred (N. Y.)	+ 42 15 19.8	— 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.04
Algier	+ 36 45 2.7	— 11 1.6	9.999483	— 5 20 23.43	— 0 12 11.39
Allegheny	+ 40 27 41.6	— 11 21.6	9.999391	+ 0 11 50.89	+ 5 20 2.93
Altona	+ 53 32 45.3	— 11 0.8	9.999063	— 5 47 58.39	— 0 39 46.35
Amherst	+ 42 22 17.1	— 11 27.5	9.999343	— 0 18 7.37	+ 4 50 4.67
Annapolis	+ 38 58 53.5	— 11 15.0	9.999428	— 0 2 15.60	+ 5 5 56.44
Ann Arbor	+ 42 16 48.0	— 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.14
Arcetri	+ 43 45 14.4	— 11 29.9	9.999308	— 5 53 15.15	— 0 45 3.11
Armagh	+ 54 21 12.7	— 10 54.9	9.999043	— 4 41 36.54	+ 0 26 35.5
Athens	+ 37 58 20.0	— 11 9.4	9.999453	— 6 43 7.74	— 1 34 55.7
Beloit	+ 42 30 9.0	— 11 27.8	9.999340	+ 0 47 55.26	+ 5 56 7.30
Berlin	+ 52 30 16.7	— 11 7.7	9.999088	— 6 1 46.95	— 0 53 34.91
Berne	+ 46 57 8.7	— 11 29.2	9.999227	— 5 37 58.04	— 0 29 46.0
Bethlehem	+ 40 36 23.9	— 11 22.2	9.999388	— 0 6 40.19	+ 5 1 31.85
Birr Castle	+ 53 5 47.0	— 11 3.9	9.999074	— 4 36 31.14	+ 0 31 40.9
Bologna	+ 44 29 47.0	— 11 30.5	9.999289	— 5 53 36.64	— 0 45 24.6
Bonn	+ 50 43 45.0	— 11 17.3	9.999132	— 5 36 35.33	— 0 28 23.29
Bordeaux	+ 44 50 16.7	— 11 30.7	9.999281	— 5 6 6.60	+ 0 2 5.44
Bothkamp	+ 54 12 9.6	— 10 56.0	9.999047	— 5 48 42.84	— 0 40 30.8
Breslau	+ 51 6 56.5	— 11 15.4	9.999122	— 6 16 20.75	— 1 8 8.71
Brussels	+ 50 51 10.5	— 11 16.8	9.999129	— 5 25 40.64	— 0 17 28.6
Cambridge (England)	+ 52 12 51.6	— 11 9.4	9.999095	— 5 8 34.79	— 0 0 22.75
Cambridge (Mass.)	+ 42 22 47.6	— 11 27.6	9.999343	— 0 23 41.05	+ 4 44 30.99
Cape of Good Hope	— 33 56 3.4	+ 10 39.0	9.999550	— 6 22 6.78	— 1 13 54.74
Chapultepec	+ 19 25 17.5	— 7 12.0	9.999841	+ 1 28 26.20	+ 6 36 38.24
Charkow	+ 50 0 10.2	— 11 20.5	9.999160	— 7 33 6.74	— 2 24 54.7
Chicago	+ 41 50 1.0	— 11 26.2	9.999357	+ 0 42 15.02	+ 5 50 27.06
Christiania	+ 59 54 43.7	— 10 0.2	9.998914	— 5 51 5.89	— 0 42 53.85
Cincinnati (New Obs.)	+ 39 8 19.5	— 11 15.8	9.999424	+ 0 29 29.25	+ 5 37 41.29
Cincinnati (Old Obs.)	+ 39 6 26.5	— 11 15.6	9.999425	+ 0 29 47.01	+ 5 37 59.05
Clinton	+ 43 3 17.0	— 11 28.9	9.999326	— 0 6 34.65	+ 5 1 37.39
Coimbra	+ 40 12 25.8	— 11 20.6	9.999398	— 4 34 37.54	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	— 10 43.9	9.999011	— 5 58 30.96	— 0 50 18.92
Cordoba	— 31 25 15.5	+ 10 13.5	9.999608	— 0 51 23.84	+ 4 16 48.2
Cracow	+ 50 3 50.0	— 11 20.3	9.999149	— 6 28 2.41	— 1 19 50.37
Dantzic	+ 54 21 18.0	— 10 54.9	9.999043	— 6 22 51.34	— 1 14 39.3
Dorpat	+ 58 22 47.4	— 10 17.6	9.998948	— 6 55 5.54	— 1 46 53.5
Dresden	+ 51 2 16.8	— 11 15.8	9.999124	— 6 3 6.88	— 0 54 54.84
Dublin	+ 53 23 13	— 11 1.9	9.999066	— 4 42 50.04	+ 0 25 22
Düsseldorf	+ 51 12 25	— 11 15.0	9.999120	— 5 35 17.04	— 0 27 5
Dun Echt	+ 57 9 36	— 10 30.2	9.998977	— 4 58 32.04	+ 0 9 40.0
Durham	+ 54 46 6.2	— 10 51.6	9.999033	— 5 1 52.24	+ 0 6 19.8
Edinburgh	+ 55 57 23.2	— 10 41.5	9.999005	— 4 55 28.99	+ 0 12 43.05
Florence	+ 43 46 4.1	— 11 29.9	9.999308	— 5 53 13.54	— 0 45 1.5

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ .	Longitude	
				From Washington.	From Greenwich.
				^h ^m ^s	^h ^m ^s
Geneva	+ 46 11 58.8	— 11 30.1	9.999246	— 5 32 48.81	— 0 24 36.77
Georgetown . . .	+ 38 54 26.2	— 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.24
Glasgow (<i>Missouri</i>) .	+ 39 13 45.6	— 11 16.2	9.999422	+ 1 3 5.93	+ 6 11 17.97
Glasgow (<i>Scotland</i>) .	+ 55 52 42.8	— 10 42.2	9.999006	— 4 51 1.44	+ 0 17 10.6
Göttingen . . .	+ 51 31 47.9	— 11 13.3	9.999112	— 5 47 58.28	— 0 39 46.24
Gotha	+ 50 56 37.5	— 11 16.3	9.999127	— 5 51 2.57	— 0 42 50.53
Greenwich . . .	+ 51 28 38.4	— 11 13.6	9.999113	— 5 8 12.04	0 0 0
Hamburg	+ 53 33 7.0	— 11 0.8	9.999062	— 5 48 5.74	— 0 39 53.7
Hanover	+ 43 42 15	— 11 29.8	9.999309	— 0 19 4.13	+ 4 49 7.91
Hastings-on-Hudson .	+ 40 59 25	— 11 23.6	9.999378	— 0 12 42.4	+ 4 55 29.64
Haverford . . .	+ 40 0 40.1	— 11 19.8	9.999402	— 0 6 59.34	+ 5 1 12.70
Helsingfors . . .	+ 60 9 43.3	— 9 57.1	9.998909	— 6 48 1.20	— 1 39 49.16
Hudson	+ 41 14 42.6	— 11 24.4	9.999271	+ 0 17 32.12	+ 5 25 44.16
Ipswich	+ 52 0 33.0	— 11 11.0	9.999100	— 5 13 7.84	— 0 4 55.80
Karlsruhe . . .	+ 49 0 29.6	— 11 24.2	9.999175	— 5 41 48.55	— 0 33 36.51
Kasan	+ 55 47 24.2	— 10 43.0	9.999009	— 8 24 40.94	— 3 16 28.9
Kew	+ 51 28 6	— 11 13.6	9.999114	— 5 6 56.94	+ 0 1 15.1
Kiel	+ 54 20 29.7	— 10 55.0	9.999043	— 5 48 47.80	— 0 40 35.76
Kiew	+ 50 27 11.1	— 11 18.6	9.999139	— 7 10 12.68	— 2 2 0.64
Königsberg . . .	+ 54 42 50.6	— 10 52.0	9.999034	— 6 30 10.95	— 1 21 58.91
Kremsmünster . .	+ 48 3 23.7	— 11 27.0	9.999199	— 6 4 44.24	— 0 56 32.2
Leiden	+ 52 9 20.0	— 11 9.8	9.999097	— 5 26 8.39	— 0 17 56.35
Leipzig	+ 51 20 6.3	— 11 14.3	9.999117	— 5 57 46.06	— 0 49 34.02
Leyton	+ 51 34 34	— 11 13.0	9.999111	— 5 8 11.17	+ 0 0 0.87
Lisbon (<i>Marine Obs.</i>)	+ 38 42 17.6	— 11 13.5	9.999435	— 4 31 47.04	+ 0 36 25.0
Lisbon (<i>Royal Obs.</i>)	+ 38 42 31.3	— 11 13.6	9.999435	— 4 31 27.36	+ 0 36 44.68
Liverpool . . .	+ 53 24 4	— 11 1.8	9.999066	— 4 55 54.84	+ 0 12 17.2
Lübec	+ 53 51 31.2	— 10 58.6	9.999055	— 5 50 57.59	— 0 42 45.55
Lund	+ 55 41 52.1	— 10 43.8	9.999011	— 6 0 57.07	— 0 52 45.03
Lyons	+ 45 41 40.0	— 11 30.5	9.999259	— 5 27 19.90	— 0 19 7.86
Madison	+ 43 4 37.0	— 11 28.9	9.999325	+ 0 49 24.11	+ 5 57 36.15
Madras	+ 13 4 8.1	— 5 3.3	9.999926	— 10 29 11.46	— 5 20 59.42
Madrid	+ 40 24 30.0	— 11 21.4	9.999393	— 4 53 26.64	+ 0 14 45.4
Manheim	+ 49 29 11.0	— 11 22.5	9.999163	— 5 42 2.56	— 0 33 50.52
Marburg	+ 50 48 46.9	— 11 16.9	9.999130	— 5 43 17.04	— 0 35 5.0
Märkree	+ 54 10 31.8	— 10 56.2	9.999047	— 4 34 23.64	+ 0 33 48.4
Marseilles . . .	+ 43 18 19.1	— 11 29.3	9.999320	— 5 29 46.68	— 0 21 34.64
Melbourne . . .	— 37 49 53.3	+ 11 8.6	9.999456	— 14 48 6.18	— 9 39 54.14
Mexico	+ 19 26 1.3	— 7 12.2	9.999840	+ 1 28 14.63	+ 6 36 26.67
Milan	+ 45 27 59.2	— 11 30.6	9.999265	— 5 44 58.01	— 0 36 45.97
Modena	+ 44 38 52.8	— 11 30.6	9.999285	— 5 51 54.84	— 0 43 42.8
Montsouris . . .	+ 48 49 18.0	— 11 24.8	9.999180	— 5 17 32.72	— 0 9 20.68
Moscow	+ 55 45 19.8	— 10 43.3	9.999009	— 7 38 28.94	— 2 30 16.9
Mount Hamilton .	+ 37 20 23.5	— 11 5.5	9.999468	+ 2 58 22.05	+ 8 6 34.09
Munich	+ 48 8 45.5	— 11 26.7	9.999197	— 5 54 38.17	— 0 46 26.13
Naples	+ 40 51 45.4	— 11 23.1	9.999381	— 6 5 12.94	— 0 57 0.9
Nashville . . .	+ 36 8 58.2	— 10 57.3	9.999497	+ 0 38 55.93	+ 5 47 7.97

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log p .	Longitude	
				From Washington.	From Greenwich.
Natal	— 29° 50' 47.0	+ 9 55.2	9.999642	— 7 10 13.20	— 2 2 1.16
Neuchatel . . .	+ 46 59 51.0	— 11 29.1	9.999226	— 5 36 2.24	— 0 27 50.2
New Haven . . .	+ 41 18 36.5	— 11 24.6	9.999370	— 0 16 29.90	+ 4 51 42.14
New York (Columb. Coll.)	+ 40 45 23.1	— 11 22.7	9.999384	— 0 12 18.40	+ 4 55 53.64
New York (RUTHERFORD)	+ 40 43 48.5	— 11 22.6	9.999384	— 0 12 15.00	+ 4 55 57.04
Nice	+ 43 43 16.7	— 11 29.8	9.999309	— 5 37 24.24	— 0 29 12.20
Nicolaëff . . .	+ 46 58 20.6	— 11 29.2	9.999226	— 7 16 6.14	— 2 7 54.1
Odessa	+ 46 28 36	— 11 29.8	9.999239	— 7 11 14.34	— 2 3 2.3
Ogden	+ 41 13 8.6	— 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.56
O-Gyalla	+ 47 52 43.4	— 11 27.4	9.999204	— 6 20 57.63	— 1 12 45.59
Olmütz	+ 49 35 43	— 11 22.1	9.999160	— 6 17 14.64	— 1 9 2.6
Oxford (Mississippi)	+ 34 22 12.6	— 10 42.9	9.999540	+ 0 49 55.05	+ 5 58 7.09
Oxford (Radcliffe)	+ 51 45 36.0	— 11 12.0	9.999106	— 5 3 9.44	+ 0 5 2.6
Oxford (University)	+ 51 45 34.2	— 11 12.0	9.999106	— 5 3 11.64	+ 0 5 0.40
Padua	+ 45 24 2.5	— 11 30.6	9.999266	— 5 55 41.17	— 0 47 29.13
Palermo	+ 38 6 44	— 11 10.2	9.999449	— 6 1 37.04	— 0 53 25.0
Paramatta . . .	— 33 48 49.8	+ 10 37.8	9.999553	— 15 12 18.24	— 10 4 6.2
Paris	+ 48 50 11.8	— 11 24.8	9.999179	— 5 17 32.99	— 0 9 20.95
Philadelphia . .	+ 39 57 7.5	— 11 19.5	9.999404	— 0 7 33.58	+ 5 0 38.46
Plonsk	+ 52 37 40.0	— 11 6.9	9.999085	— 6 29 44.05	— 1 21 32.01
Pola	+ 44 51 49.0	— 11 30.6	9.999290	— 6 3 35.22	— 0 55 23.18
Portsmouth . . .	+ 50 48 3.0	— 11 17.0	9.999130	— 5 3 48.14	+ 0 4 23.90
Potsdam	+ 52 22 56	— 11 8.4	9.999091	— 6 0 29.04	— 0 52 17
Poughkeepsie . .	+ 41 41 18	— 11 25.8	9.999360	— 0 12 38.44	+ 4 55 33.6
Prague	+ 50 5 18.8	— 11 20.2	9.999148	— 6 5 53.44	— 0 57 41.4
Princeton	+ 40 20 57.8	— 11 21.2	9.999394	— 0 9 34.54	+ 4 58 37.50
Pulkowa	+ 59 46 18.7	— 10 1.8	9.999817	— 7 9 30.71	— 2 1 18.67
Quebec	+ 46 48 17.3	— 11 29.4	9.999231	— 0 23 22.74	+ 4 44 49.3
Rio de Janeiro . .	— 22 54 23.8	+ 8 14.0	9.999782	— 2 15 30.63	+ 2 52 41.41
Rochester	+ 43 9 16.8	— 11 29.0	9.999324	+ 0 2 9.74	+ 5 10 21.78
Rome (Coll. Rom.) .	+ 41 53 53.6	— 11 26.3	9.999355	— 5 58 6.74	— 0 49 54.70
San Fernando . .	+ 36 27 41.5	— 10 59.5	9.999490	— 4 43 22.44	+ 0 24 49.6
Santiago de Chile .	— 33 26 42.0	+ 10 34.4	9.999561	— 0 25 25.74	+ 4 42 46.30
Schwerin	+ 53 37 38.2	— 11 0.2	9.999061	— 5 53 52.74	— 0 45 40.7
Senftenberg . . .	+ 50 5 10.1	— 11 20.2	9.999148	— 6 14 2.64	— 1 5 50.6
South Hadley . . .	+ 42 15 18.2	— 11 27.3	9.999346	— 0 17 51.75	+ 4 50 20.29
Speier	+ 49 18 55.4	— 11 23.2	9.999167	— 5 41 57.64	— 0 33 45.6
St. Louis	+ 38 38 3.6	— 11 13.2	9.999437	+ 0 52 37.07	+ 6 0 49.11
St. Petersburg . .	+ 59 56 29.7	— 9 59.8	9.998913	— 7 9 25.54	— 2 1 13.5
Stockholm	+ 59 20 33.0	— 10 6.9	9.998927	— 6 20 26.04	— 1 12 14.00
Stonyhurst . . .	+ 53 50 40	— 10 58.7	9.999055	— 4 58 19.36	+ 0 9 52.68
Strassburg (New Obs.)	+ 48 34 59.7	— 11 25.5	9.999186	— 5 39 16.69	— 0 31 4.65
Strassburg (Old Obs.)	+ 48 34 53.8	— 11 25.5	9.999186	— 5 39 14.53	— 0 31 2.49
Sydney	— 33 51 41.1	+ 10 38.3	9.999552	— 15 13 1.58	— 10 4 49.54
Taschkent	+ 41 19 32.2	— 11 24.7	9.999369	— 9 45 22.84	— 4 37 10.80
Toulouse	+ 43 36 47	— 11 29.7	9.999312	— 5 14 3.14	— 0 5 51.1
Turin	+ 45 4 6.0	— 11 30.7	9.999275	— 5 39 0.44	— 0 30 48.4

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ .	Longitude	
				From Washington.	From Greenwich.
Twickenham . . .	+ 51 27 4.2	- 11 13.7	9.999114	- 5 6 58.94	+ 0 1 13.1
Univ. of Virginia . .	+ 38 2 1.2	- 11 9.8	9.999448	+ 0 5 48.68	+ 5 14 00.72
Upsala	+ 59 51 31.5	- 10 0.8	9.998915	- 6 18 42.23	- 1 10 30.19
Utrecht	+ 52 5 10.5	- 11 10.2	9.999098	- 5 28 43.74	- 0 20 31.7
Venice	+ 45 25 49.5	- 11 30.6	9.999266	- 5 57 37.44	- 0 49 25.4
Vienna (<i>Josephstadt</i>)	+ 48 12 53.8	- 11 26.6	9.999195	- 6 13 37.34	- 1 5 25.3
Vienna (<i>New Obs.</i>) .	+ 48 13 55.4	- 11 26.5	9.999195	- 6 13 33.26	- 1 5 21.22
Vienna (<i>Old Obs.</i>) .	+ 48 12 35.5	- 11 26.6	9.999195	- 6 13 43.78	- 1 5 31.74
Warsaw	+ 52 13 5.7	- 11 9.4	9.999095	- 6 32 19.44	- 1 24 7.4
Washington	+ 38 53 38.8	- 11 14.5	9.999430	0 0 0	+ 5 8 12.04
West Point	+ 41 23 31	- 11 24.9	9.999368	- 0 12 22.71	+ 4 55 49.33
Wilhelmshaven . . .	+ 53 31 52.0	- 11 0.9	9.999063	- 5 40 47.25	- 0 32 35.21
Williamstown (<i>Mass.</i>)	+ 42 42 49	- 11 28.3	9.999334	- 0 15 18.6	+ 4 52 53.44
Williamstown (<i>Victoria</i>)	- 37 52 7.2	+ 11 8.8	9.999455	- 14 47 50.84	- 9 39 38.8
Wilna	+ 54 41 0	- 10 52.3	9.999035	- 6 49 23.94	- 1 41 11.9
Windsor	- 33 36 28.9	+ 10 35.9	9.999558	- 15 11 32.81	- 10 3 20.77
Zürich	+ 47 22 40.0	- 11 28.5	9.999216	- 5 42 24.64	- 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or Apparent Solar Time is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time*. By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time*. Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over the meridian, and its next succeeding return to the same meridian. It is about $3^m 56^s$ shorter than the mean solar day; $365\frac{1}{4}$ solar days, or a year, being divided into $366\frac{1}{4}$ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about $3^m 46^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h , astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h , astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 hours. If greater than 12 hours, we subtract 12 hours from it, add 1 to the days, and write A. M. For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M. civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, added to the local time, or, when *east*, subtracted from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension and Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hour, and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h 0^m 0^s$. The longitude from Greenwich expressed in time, if *west*, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if *east*, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1890, May 31, at a place whose longitude is $179^{\circ} 40'$, or $11^{\text{h}} 58^{\text{m}} 40^{\text{s}}$ east from Greenwich:

Local apparent time	May 31,	^h	^m	^s
Longitude from Greenwich (subtractive)		11	58	40
Greenwich apparent time	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^{\text{h}}.022$ after Greenwich apparent noon on May 30, or $11^{\text{h}}.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

May 30, at Greenwich apparent noon	22'.09
May 31, at Greenwich apparent noon	21.14
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follow:—

Difference for one hour, May 30	22'.09
Change for 0.25 of a day or $0''.95 \times 0.25$	0.24
Difference at 6 hours after noon	21.85
$21''.85 \times 12.022 = 262''.7 = 4' 22''.7$	

Declination at Greenwich noon, May 30	N. $21^{\circ} 48' 32''.6$
Change in 12.022 hours (additive)	4 22.7
Sun's declination at time of observation	N. $21^{\circ} 52' 55.3$

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^{\text{h}}.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is $21''.38$. Then, we find:—

Declination at Greenwich noon, May 31	N. $21^{\circ} 57' 11''.5$
Product of $21''.38 \times 11.978 = 256''.2$ (subtractive)	4 16.2
Sun's declination at time of observation	N. $21^{\circ} 52' 55.3$

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of BOWDITCH'S *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of Bowditch's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1890, May 15, 9^h 2^m 30^s, A. M., mean time, at a place whose longitude is 100° 20', or 6^h 40^m 40^s, west of Greenwich.

Local astronomical mean time	.	.	.	May 14,	^h 21	^m 2	^s 30
Longitude from Greenwich (additive)	.	.	.	.	.	6	40 40
Greenwich mean time.	.	.	.	May 15,	3	43	10 = 3 ^h 7194

<i>Sun's Right Ascension.</i>		<i>Equation of Time.</i>	
May 15, Greenwich noon	$\begin{smallmatrix} h & m & s \\ 3 & 28 & 48.16 \end{smallmatrix}$	May 15, noon	$\begin{smallmatrix} m & s \\ 3 & 51.32 \end{smallmatrix}$ (additive).
H. D. $9^{\circ}.882 \times 3.7194$	$+ 0 \ 36.76$	H. D. $-0^{\circ}.026 \times 3.72$	$- 0.10$
	$\underline{3 \ 29 \ 24.92}$		$\underline{3 \ 51.22}$

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

May 15, Sidereal Time (at Greenwich mean noon)	$\begin{smallmatrix} h & m & s \\ 3 & 32 & 39.48 \end{smallmatrix}$
Hourly difference $9^{\circ}.8565 \times 3.7194$	$+ 0 \ 36.66$
Add the local astronomical mean time	$21 \ 2 \ 30.00$
The required sidereal time is (rejecting 24^h)	$0 \ 35 \ 46.14$

The reduction $0^m \ 36.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h \ 43^m \ 10^s$. Also, by Table LI of Bowditch's *Navigator*, the reduction is $6^m \ 36.7$.

3.—On 1890, May 15, A. M., at a place whose longitude is $100^{\circ} \ 10' \ W.$, suppose the sidereal time to be $0^h \ 36^m \ 37^s.16$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, $+ 6^h \ 40^m \ 40^s$, or $+ 6^h.678$.

May 14, Sidereal Time (at Greenwich mean noon)	$\begin{smallmatrix} h & m & s \\ 3 & 28 & 42.93 \end{smallmatrix}$
The H. D. $9^{\circ}.8565 \times 6.678$, or the reduction for $6^h \ 40^m \ 40^s$ in Table III	$+ 1 \ 5.82$
The sidereal time of local mean noon	$3 \ 29 \ 48.75$
The given sidereal time ($+ 24^h$, if necessary for the following subtraction)	$24 \ 36 \ 37.16$
Subtracting the first from the second gives the sidereal interval from noon	$21 \ 6 \ 48.41 = 21^h.11345$
$- 9^{\circ}.8296 \times 21.11345$, or the reduction for $21^h \ 6^m \ 48^s.41$ in Table II	$- 3 \ 27.54$
The required astronomical mean time is	May 14, $21 \ 3 \ 20.87$

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude and Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ' ; λ representing the sun's longitude counted from the true equinox of the date; and λ' , the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon*; that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $- 9^{\circ}.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of Bowditch's *Navigator*.

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

May 14, the mean time of Greenwich sidereal noon is	$\begin{smallmatrix} h & m & s \\ 20 & 27 & 55.35 \end{smallmatrix}$
The H. D. $- 9^{\circ}.8296 \times 6.678$, or the reduction for long., Table II	$- 1 \ 5.64$
The mean time of local sidereal noon	$20 \ 26 \ 49.71$
Add the given sidereal time	$0 \ 36 \ 37.16 = 0^h.6103$
The sum is	$21 \ 3 \ 26.87$
$- 9^{\circ}.8296 \times 0.6103$, or the reduction for $0^h \ 36^m \ 37^s.2$ in Table II	$- 0 \ 6.00$
The required astronomical mean time	May 14, $21 \ 3 \ 20.87$

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of *Bowditch's Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1890, May 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 21 is 3''; then,

$$12^h : 10^h = 3'' : 2''.5,$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The moon's semidiameter then, for May 21, 10^h, is 14' 57''.7 — 2''.5, or 14' 55''.2.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from *Bowditch's Table XXVIII*. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1890, May 1, 10^h 10^m 30^s, astronomical mean time at Greenwich:—

	Right Ascension.			Declination.		
	^h	^m	^s			
May 1, 10 ^h	12	25	5.32	N.	2	46 30''.5
Diff. 1''.9541 × 10.5 . . .	= + 20.52			13''.212 × 10.5 =	— 2 18.7	
May 1, 10 ^h 10 ^m 30 ^s . . .	12	25	25.84	N.	2	46 11.8

The differences interpolated for 5^m.2 = 0^m.09 are, for the right ascension 1''.9553, and for the declination 13''.234, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1"; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time*, given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5' or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1890, May 12, the corrected distance of the moon's centre from that of a *Aquila* is $48^{\circ} 12'$:—

Corrected distance	.	.	.	.	48° 12' 0"	
Distance in Ephemeris May 12, VI ^h	.	.	.	.	48 26 19	P. L. 0.3960
Difference	.	.	.	.	0 14 19	P. L. 1.0994
						P. L. 0.7134
Time from VI ^h (<i>before</i>)	.	.	.	.	—0 34 49.5	
Corr. for 2d Diff., Table I	.	.	.	.	+ 14.5	
Greenwich mean time May 12.	.	.	.	.	5 25 25.0	

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.3860
Diff. of distances, $14^{\circ} 19'' = 859''$	log	2.9340
Red. of Greenwich time, $2089^{\circ}.5 = 0^{\text{h}} 34^{\text{m}} 49^{\circ}.5$	log	3.3200

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The last two columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. 0* give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 421.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's

equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. The *Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of BESSEL, and the constants of PETERS and STRUVE. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of α Hydra for 1890, Feb. 14, for the upper transit at Washington.

(Star-Catalogue)	$\log a$	0.4699	$\log b$	7.8690	$\log c$	8.7159 n	$\log d$	8.6315
(Page 281)	$\log A$	9.2830 n	$\log B$	9.2743 n	$\log C$	1.1943 n	$\log D$	1.0521
(Star-Catalogue)	$\log a'$	1.1898 n	$\log b'$	9.8032 n	$\log c'$	9.7158	$\log d'$	9.0407
	$\log Aa$	9.7529 n	$\log Bb$	7.1433 n	$\log Cc$	9.9102	$\log Dd$	9.6836
	$\log Aa'$	0.4728	$\log Bb'$	9.0775	$\log Cc'$	0.9101 n	$\log Dd'$	0.0928

<i>Mean Place</i> , 1890.0, (page 296)	$\alpha_0 =$	$9^{\circ} 22' 10.925''$	$\delta_0 =$	$- 8^{\circ} 10' 55.80''$
	$Aa =$	$- 0.566$	$Aa' =$	$+ 2.97$
	$Bb =$	$- 0.001$	$Bb' =$	$+ 0.12$
	$Cc =$	$+ 0.813$	$Cc' =$	$- 8.13$
	$Dd =$	$+ 0.483$	$Dd' =$	$+ 1.24$
	$E =$	$- 0.003$	$\tau \mu' =$	0.00
	$\tau \mu =$	0.000		

<i>Apparent Place</i> , 1890, Feb. 14,	$\alpha =$	$9^{\circ} 22' 11.651''$	$\delta =$	$- 8^{\circ} 10' 59.60''$
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Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of BESSEL by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, *a*, *b*, *c*, *d*, *a'*, *b'*, *c'*, *d'*. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of α Hydræ for 1890, Feb. 14, for the upper transit at Washington.

$\alpha_0 = 140^\circ 33'$		$\delta_0 = - 8^\circ 10.9'$	
$G = 182^\circ 48'$		$G + \alpha_0 = 323^\circ 21'$	
$H = 305 49$		$H + \alpha_0 = 86 22$	
$\log \tau$	8.8239	$\log \tau$	8.8239
$\log g$	0.5860	$\log h$	1.2852
$\log \sin (G + \alpha_0)$	9.7759 <i>n</i>	$\log \sin (H + \alpha_0)$	9.9991
$\log \tan \delta_0$	9.1577 <i>n</i>	$\log \sec \delta_0$	0.0044
$\log (g)$	8.3435	$\log (h)$	0.1126
		<i>Apparent R. A.,</i>	$\alpha = 9 22 11.650$
$\log g$	0.5860	$\log h$	1.2852
$\log \cos (G + \alpha_0)$	9.9043	$\log \cos (H + \alpha_0)$	8.8019
$\log (g')$	0.4903	$\log \sin \delta_0$	9.1532 <i>n</i>
		$\log (h')$	9.2403 <i>n</i>
$\log i$	0.8317 <i>n</i>	<i>Apparent Dec.,</i>	$\delta = - 8 10 59.60$
$\log \cos \delta_0$	9.9956		
$\log (i)$	0.8273 <i>n</i>		

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1889, or the moment when the sun's mean longitude is 280° .

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90° . The time of observation and the setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume of 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.

Pages 302—313 contain the apparent positions of the four north polar stars, α , δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date*.

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit

may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiameter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—411 contain the geocentric apparent right ascensions and declinations of the seven major planets and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 415—420 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible, are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1890, Dec. 11, begins at Hobart Town.

We compare the distance of the place from the curves of 14^h and 15^h and we find it to correspond to about 22 minutes, therefore the time of beginning is approximately 14^h 22^m, which is probably correct to within 2 or 3 minutes. Changing to local mean time the result will be:—

Greenwich mean time	.	.	.	.	.	.	.	Dec. 11,		^h	^m
Longitude East	.	.	.	.	.	.	.		+	14	22
Local mean time	.	.	.	.	.	.	.	Dec. 12,		9	49.3
										0	11.3

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of *X*, and the centre of the earth as the origin of co-ordinates. The axis of *Y* is perpendicular to that of *X*, and directed toward the north; *x* and *y* are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle *d*, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle *μ* is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f' , the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x , y and μ , in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ , η and ζ , of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.	Log G.
0°	0.00000	0.00302
5	0.00001 1	0.00300 3
10	0.00005 4	0.00297 3
15	0.00010 5	0.00292 5
20	0.00018 8	0.00284 8
25	0.00027 9	0.00275 9
30	0.00038 11	0.00264 11
35	0.00050 12	0.00252 12
40	0.00062 12	0.00239 13
45	0.00075 13	0.00226 13
50	0.00088 13	0.00213 13
55	0.00101 13	0.00201 12
60	0.00113 12	0.00189 12
65	0.00124 11	0.00178 11
70	0.00133 9	0.00169 9
75	0.00141 8	0.00161 8
80	0.00146 6	0.00155 6
85	0.00150 4	0.00152 3
90	0.00151 1	0.00151 1

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Put:

λ , the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (\mu - \lambda) \\ \eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) \\ \zeta &= \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)\end{aligned}$$

and their variations in one minute of mean time will be:—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \zeta' &\text{ is not wanted.}\end{aligned}$$

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y' . Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N , are computed by the formulæ:—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth when $\sin \psi$ is negative. But, simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90^\circ$ and -90° . The correction τ to the assumed time will be found in minutes, from—

$$\text{For beginning:} \quad \tau = - \frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

$$\text{For ending:} \quad \tau = - \frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one near that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. The computation for the first assumed time will give a small value of τ which, applied to the assumed time, will give a nearly correct time for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value of τ , to be applied to the assumed time for the end, and a large negative and inaccurate one to be subtracted for the beginning. We shall thus deduce two times of each phase only one of which is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction τ , multiplied by the sine of the sun's hour-angle, $(\mu-\lambda)$, for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin (\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^m.001 \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, further corrections and computations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

$$\text{For beginning:} \quad P = N - \psi \pm 180^\circ$$

$$\text{For end:} \quad P = N + \psi$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1890, June 16—17, for Port Suda Light-house, in the Island of Candia

$$\text{Latitude, } \varphi = + 35^\circ 27' 55''$$

$$\text{Longitude, } \lambda = - 24^\circ 9' 30''$$

Constants for the given place:—

$$\rho \sin \varphi' = 9.76116$$

$$\rho \cos \varphi' = 9.91136$$

From the Eclipse Chart the approximate times of the phases are found to be as follow:—

Beginning	June 16	^d 20	^h 0	^m 0	} Greenwich Mean Time.
Annulus			21	40	
Ending			23	30	
Greenwich Mean Time,		Beginning.	Annulus.		Ending.
		20 ^h 0 ^m	21 ^h 40 ^m		23 ^h 30 ^m
	μ	299° 51' 12"	324° 51' 6"		352° 21' 0"
	λ	— 24 9 30	— 24 9 30		— 24 9 30
	$\mu-\lambda$	324 0 42	349 0 36		16 30 30
	$\rho \cos \varphi'$	9.91136	9.91136		9.91136
	$\sin (\mu-\lambda)$	9.76909 <i>n</i>	9.28021 <i>n</i>		9.45355
	$\log \xi$	9.68045 <i>n</i>	9.19157 <i>n</i>		9.36491
	ξ	— 0.47912	— 0.15544		+ 0.23169

Greenwich Mean Time,	Beginning. 20 ^h 0 ^m	Annulus. 21 ^h 40 ^m	Ending. 23 ^h 30 ^m
$\rho \sin \varphi'$	9.76116	9.76116	9.76116
$\cos d$	9.96275	9.96274	9.96274
	9.72391	9.72390	9.72390
(1) +	0.52955	+ 0.52955	+ 0.52955
$\rho \cos \varphi'$	9.91136	9.91136	9.91136
$\sin d$	9.59884	9.59887	9.59890
$\cos (\mu - \lambda)$	9.90802	9.99196	9.98174
	9.41822	9.50219	9.49200
(2) +	0.26195	+ 0.31783	+ 0.31046
(1) - (2) η +	0.26760	+ 0.21172	+ 0.21909
$\rho \sin \varphi'$	9.76116	9.76116	9.76116
$\sin d$	9.59884	9.59887	9.59890
	9.36000	9.36003	9.36006
(3) +	0.22909	+ 0.22910	+ 0.22912
$\rho \cos \varphi'$	9.91136	9.91136	9.91136
$\cos d$	9.96275	9.96274	9.96274
$\cos (\mu - \lambda)$	9.90802	9.99196	9.98174
	9.78213	9.86606	9.85584
(4) +	0.60552	+ 0.73462	+ 0.71753
(3) + (4) ζ +	0.83461	+ 0.96372	+ 0.94665
const. log	7.63992	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.81938	9.90332	9.89310
$\log \xi'$	7.45930	7.54324	7.53302
ξ' +	0.002879	+ 0.003493	+ 0.003412
const. log	7.63992	7.63992	7.63992
$\log \xi$	9.68045 <i>n</i>	9.19157 <i>n</i>	9.36491
$\sin d$	9.59884	9.59887	9.59890
$\log \eta'$	6.91921 <i>n</i>	6.43036 <i>n</i>	6.60373
η' -	0.000830	- 0.0002694	+ 0.0004015
$x - \xi$ -	0.52900	- 0.00205	+ 0.54666
$y - \eta$ -	0.17331	- 0.00597	+ 0.10823
$x' - \xi'$ +	0.005626	+ 0.005014	+ 0.005095
$y' - \eta'$ +	0.001949	+ 0.001380	+ 0.0006985
$m \sin M$	9.72346 <i>n</i>	7.31175 <i>n</i>	9.73772
$m \cos M$	9.23882 <i>n</i>	7.77597 <i>n</i>	9.03435
$\tan M$	0.48464	9.53578	0.70337
M	251° 51' 38''	198° 57' 0''	78° 48' 5''
$\cos M$	9.49322 <i>n</i>	9.97580 <i>n</i>	9.28828
$\log m$	9.74560	7.80017	9.74607
$n \sin N$	7.75020	7.70018	7.70714
$n \cos N$	7.28981	7.13988	6.84417
$\tan N$	0.46039	0.56030	0.86297
N	70° 53' 34''	74° 36' 42''	82° 11' 37''
$\cos N$	9.51500	9.42384	9.13298
$\log n$	7.77481	7.71604	7.71119

Greenwich Mean Time,		Beginning. 20 ^h 0 ^m	Annulus. 21 ^h 40 ^m	Ending. 23 ^h 30 ^m
	$\log \zeta$	9.92149	9.98395	9.97619
	$\tan f$	7.66294	7.66083	7.66294
		7.58443	7.64478	7.63913
		0.00384	0.00441	0.004356
	l	0.56097	0.01519	0.561250
	L	0.55713	0.01078	0.556894
	$\sin (M-N)$	8.22763 n	9.91683	8.77211 n
	$\log m$	9.74560	7.80017	9.74607
	$\csc L$	0.25404	1.96752	0.25423
	$\sin \psi$	8.22727 n	9.68452	8.77241 n
	ψ	- 0° 58' 1"	28° 55' 25"	- 3° 23' 36"
	$\log \frac{m}{n}$	1.97079	0.08413	2.03488
	$\cos (M-N)$	9.99994 n	9.75134 n	9.99924
		1.97073 n	9.83547 n	2.03412
	$-\frac{m}{n} \cos (M-N)$	+ 93 ^m .482	+ 0 ^m .6846	- 108 ^m .172
	$\log L$	9.74596	8.03248	9.74577
	$\cos \psi$	9.99994	9.94214	9.99923
	$\csc n$	2.22519	2.26396	2.28881
		1.97109	0.25858	2.03381
	$\frac{L \cos \psi}{n}$	\mp 93 ^m .560	\mp 1 ^m .8137	\pm 108 ^m .098
	τ	- 0 ^m .078	- 1.1291 + 2.4983	- 0.074
T	June 16, 20 ^h	0.000	21 ^h 40.0000	23 ^h 30.000
t	June 16, 19	59.922	21 ^h 38.8709	23 ^h 29.926
λ	1	36.633	1 36.6333	1 36.633
Local Mean Time	June 16, 21	36.555 16 ^d	23 15.5042 23 19.1316	17 ^d 1 6.559
Duration of Annulus			3 ^m 37 ^s .6	

Therefore we have finally

	d	h	m	s	
Beginning of the eclipse	June	16	21	36	33.3
Beginning of annulus		16	23	15	30.3
End of annulus		16	23	19	7.9
End of the eclipse		17	1	6	33.5

} Local Mean Time.

Angle of position :

	Beginning.	Ending.
N	70° 53.6'	82° 11.6'
$\psi (+ 180)$	179 2.0	- 3 23.6
P	251 51.6	78 48.0

Elements of Occultations.—Pages 422—447 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from 1890.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1890 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column *Y* gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y . The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\begin{aligned}\rho \sin \varphi' &= \frac{\sin \varphi}{G} \\ \rho \cos \varphi' &= F \cos \varphi\end{aligned}$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0 , putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington*.

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 450—451. This correction will have the same sign as h_0 .

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0 , ξ' and τ from the formulæ,

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos (h_0 + \frac{1}{2} h_0) \\ \tau &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

τ will then be the approximate interval between the times of geocentric and local conjunction.

By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$$\tau_1 = \tau - 0^h.5$$

$$\tau_2 = \tau + 0^h.5$$

T , the Washington mean time of geocentric conjunction in R. A.

d , the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2 . The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\xi = \rho \cos \varphi' \sin (h_0 + \tau)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau)$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos (h_0 + \tau)$$

$$\eta' = [9.4192] \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192] \xi \sin d$$

$$x = x' \tau$$

$$y = Y + y' \tau$$

Compute m , M , n and N from the equations

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

$$n' = \frac{n}{60} = [8.2218] n$$

$$\sin \psi = [0.5650] m \sin (M - N)$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad (\text{Beginning.})$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad (\text{End.})$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ , η , x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90^\circ$, or 270° , according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi [m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi [m \sin (M - N) - 0.2723] [1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle P , of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \quad \text{for immersion,}$$

$$P = N + \psi \pm 180^\circ \quad \text{for emersion,}$$

it being supposed that the value of ψ , in each case, is taken between the limits $\pm 90^\circ$.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t \xi'}{\eta + t \eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we will compute that of λ Sagittarii, on 1890, Aug. 25, for Ann Arbor, Mich., whose position is

$$\varphi = + 42^\circ 16'.8$$

$$\lambda = + 0^h 26^m.72$$

Constants for the given place,

$$\log \rho \sin \varphi' = 9.82561$$

$$\log \rho \cos \varphi' = 9.86981$$

From the table of elements, page 438, we have

$$H = + 0^h 3^m.1$$

$$h_0 = H - \lambda = - 0^h 23^m.62$$

From DOWNES's Table, pages 450—451, or from the formulæ on page 510, we find the correction to the Washington mean time of geocentric conjunction as given on page 438 to be $-9^m.73$, therefore the Washington mean time of apparent conjunction at the given place is $7^h 57^m.57$.

Assuming the duration to be one hour, we shall have by first subtracting and then adding 30 minutes, the corrections to be applied to the Washington mean time of geocentric conjunction to obtain the approximate Washington mean times of immersion and emersion to be used in the computation, thus:

		h m	
$\tau_1 = - 0 39.73$		$T + \tau_1 = \text{Aug. 25,}$	7 27.57
$\tau_2 = + 0 20.27$		$T + \tau_2 = \text{Aug. 25,}$	8 27.57
		Immersion.	Emersion.
		h m	h m
Washington Mean Time,	Aug. 25,	7 27.57	8 27.57
	h_0	- 0 23.62	- 0 23.62
	τ (in sidereal time)	- 0 39.839	+ 0 20.292
	$h_0 + \tau$	- 1 3.459	- 0 3.328
	$h_0 + \tau$ (in arc)	- $15^\circ 51' 53''$	- $0^\circ 49' 55''$

Washington Mean Time,	Aug. 25,	Immersion. 7 ^h 27 ^m .57	Emersion. 8 ^h 27 ^m .57
	$\rho \cos \varphi'$	9.86981	9.86981
	$\sin (h_0 + \tau)$	9.43675 <i>n</i>	8.16196 <i>n</i>
	$\log \xi$	9.30656 <i>n</i>	8.03177 <i>n</i>
	ξ	— 0.20256	— 0.010759
	$\rho \sin \varphi'$	9.82561	9.82561
	$\cos d$	9.95556	9.95556
	$\log \rho \sin \varphi' \cos d$	9.78117	9.78117
	(1)	+ 0.60420	+ 0.60420
	$\rho \cos \varphi'$	9.86981	9.86981
	$\sin d$	9.63368 <i>n</i>	9.63368 <i>n</i>
	$\cos (h_0 + \tau)$	9.98314	9.99995
	$\log \rho \cos \varphi' \sin d \cos (h_0 + \tau)$	9.48663 <i>n</i>	9.50344 <i>n</i>
	(2)	— 0.30664	— 0.31874
	(1) — (2)	+ 0.91084	+ 0.92294
	η		
	const. log	9.41920	9.41920
	$\log \rho \cos \varphi' \cos (h_0 + \tau)$	9.85295	9.86976
	$\log \xi'$	9.27215	9.28896
	ξ'	+ 0.18713	+ 0.19452
	const. log	9.41920	9.41920
	$\log \xi$	9.30656 <i>n</i>	8.03177 <i>n</i>
	$\sin d$	9.63368 <i>n</i>	9.63368 <i>n</i>
	$\log \eta'$	8.35944	7.08465
	η'	+ 0.02288	+ 0.001215
	$\log x'$	9.77945	9.77945
	$\log \tau$	9.82097 <i>n</i>	9.52870
	$\log x$	9.60042 <i>n</i>	9.30815
	x	— 0.39850	+ 0.20330
	$x - \xi$	— 0.19594	+ 0.21406
	$\log y'$	8.47422 <i>n</i>	8.47422 <i>n</i>
	$\log \tau$	9.82097 <i>n</i>	9.52870
	$\log y' \tau$	8.29519	8.00292 <i>n</i>
	$y' \tau$	+ 0.01973	— 0.01007
	Y	+ 0.92120	+ 0.92120
	$Y + y' \tau = y$	+ 0.94093	+ 0.91113
	$y - \eta$	+ 0.03009	— 0.01181
	$x' - \xi'$	+ 0.41467	+ 0.40728
	$y' - \eta'$	— 0.05268	— 0.03101
	$\log m \sin M$	9.29212 <i>n</i>	9.33053
	$\log m \cos M$	8.47842	8.07225 <i>n</i>
	$\tan M$	0.81370 <i>n</i>	1.25828 <i>n</i>
	M	278° 43' 50''	93° 9' 29''
	$\cos M$	9.18124	8.74106 <i>n</i>
	$\log m$	9.29718	9.33117

Washington Mean Time,	Aug. 25,	Immersion. 7 ^h 27 ^m .57	Emerison. 8 ^h 27 ^m .57
	$\log n \sin N$	9.61770	9.60989
	$\log n \cos N$	8.72165 <i>n</i>	8.49157 <i>n</i>
	$\tan N$	0.89605 <i>n</i>	1.11832 <i>n</i>
	<i>N</i>	97° 14' 25''	94° 21' 17''
	$\cos N$	9.10048 <i>n</i>	8.88042 <i>n</i>
	$\log n$	9.62117	9.61115
	$\text{colog } 60$	8.22185	8.22185
	$\log n'$	7.84302	7.83300
	const. log	0.56500	0.56500
	$\log m$	9.29718	9.33117
	$\sin (M - N)$	8.41509 <i>n</i>	8.31982 <i>n</i>
	$\sin \psi$	8.27727 <i>n</i>	8.21599 <i>n</i>
	ψ	— 1° 5' 6''	— 0° 56' 31''
	$\log \frac{m}{n'}$	1.45416	1.49817
	$\cos (M - N)$	9.99985 <i>n</i>	9.99990
	$\log \frac{m}{n'} \cos (M - N)$	1.45401 <i>n</i>	1.49807
	const. log	9.43500	9.43500
	co log <i>n'</i>	2.15698	2.16700
	$\cos \psi$	9.99992	9.99994
		1.59190	1.60194
	$-\frac{m}{n'} \cos (M - N)$	+ 28.445	— 31.483
	$\frac{[9.43500]}{n'} \cos \psi$	+ 39.075	+ 39.989
	<i>t</i> ₁	— 10.630	+ 8.506
		7 27.570	8 27.570
Washington mean time of phase, Aug. 25,		7 16.940	8 36.076
	λ	0 26.720	0 26.720
Ann Arbor mean time of phase, Aug. 25,		6 50.220	8 9.356

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 422—447, gives *H*, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \quad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and *x*,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arises from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x' . The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \frac{1}{2} \tau \cos (h_0 + \frac{1}{2} \tau) \quad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \quad (2)$$

To tabulate τ , we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916] \rho \cos \varphi' \cos h \end{aligned} \quad (3)$$

which table may be formed for every 10 minutes (in time) of h . If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \quad (4)$$

Since we must know the value of τ , approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by comparing values of τ for the two extremes of x' , namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all the intermediate values of x' . For the first approximation may be taken—

$$\begin{aligned} \frac{1}{2} \tau &= 50^m \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \frac{1}{2} \tau &= 40^m \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \quad (5)$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 450—451. It will be best to make the computation for every 30^m of h_0 , and to find the intermediate values of τ for every 10^m by interpolation. Then for each 30^m of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and $\log \xi$ with the argument h_0 , and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^m from that employed in taking out ξ' , a new value may be used to correct ξ' , and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ , and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place of every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I*.

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h . It is a mere question of convenience whether to compute the table for negative values of d , since by putting

$$\begin{aligned}\eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h\end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d , we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d . But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From *Table I* with the arguments x' and $H - \lambda = h_0$ take out the value of τ . It will be sufficient to use the nearest 0.01 of x' . τ will be of the same sign as h_0 . Then, enter *Table II* with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η . Form the quantities $y = Y + y' \tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28 , it is almost certain that there will be an occultation. If it falls without the limits ± 0.33 , it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to ± 0.32 , and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{aligned}y' < 0.10, & \quad = \pm 0.29 \\ 0.10 < y' < 0.15, & \quad = \pm 0.30 \\ 0.15 < y' < 0.20, & \quad = \pm 0.31 \\ 0.20 < y' & \quad = \pm 0.33 \text{ or } \pm 0.32\end{aligned}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v , Q and Δ from the equations

$$\begin{aligned}v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q\end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta = 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\begin{aligned}\tau_1 &= -\frac{y - \eta}{v} \sin Q & \cos P &= \frac{\Delta}{0.2723} \quad (P < 180^\circ) \\ \tau_2 &= \frac{0.2723 \sin P}{v}\end{aligned}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$

Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$

Position-angle from north toward east at immersion, $180^\circ - Q - P$

Position-angle from north toward east at emersion, $180^\circ - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 452—485.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 452—453.—The angle θ , needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360° , as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites and Disk of Mars, page 454.—This page gives the Washington mean time of the greatest eastern and western elongations, the position angles and the distances of the satellites from the centre of the planet, for three weeks preceding and following opposition.

Satellites of Jupiter, pages 455—479.—The times of phenomena are explained at the foot of each page; the diagram is on page 455.

Phenomena, pages 486—487.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0° , 90° or 180° .

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h 18^m.6$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1890.

THE adopted constants of precession, nutation, and aberration are those of STRUVE and PETERS, namely:—

$$\text{Precession} = 50''.2411 + 0''.0002268 t$$

$$\text{Nutation} = 9''.2231 + 0''.000009 t$$

$$\text{Aberration} = 20''.4451$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of HANSEN's *Tables du Soleil*, which is $0''.31$ greater than that of PETERS, given in the issues of this Ephemeris preceding that for 1882. A comparison of HANSEN's mean obliquity with that of PETERS and of LE VERRIER at different epochs is given in the following table:—

Epoch.	HANSEN.			PETERS.	LE VERRIER.	H.—P.	H.—L.
1750	23°	28'	18".19	17.44	19.42	+ 0.75	— 1.23
1800	23	27	54.80	54.22	55.63	+ 0.58	— 0.83
1850	23	27	31.42	30.99	31.83	+ 0.43	— 0.41
1900	23	27	8.02	7.76	8.03	+ 0.26	— 0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean, right ascensions of stars have been reduced to NEWCOMB's fundamental standard in the catalogue attached to the *Washington Observations for 1870*, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. GOULD's *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. GOULD; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of the additional stars in the general list, whose apparent right ascensions are given in a subsequent section, have been taken partly from the *Catalogue of 1096 Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the *Astronomische Gesellschaft* of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from BOSS's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the *Astronomische Gesellschaft* list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from AUWERS's investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
1890.0	$\Delta \alpha = + 0.110$	$\Delta \delta = - 0.50$	$\Delta \alpha = + 0.045$	$\Delta \delta = + 0.80$
1891.0	$\Delta \alpha = + 0.133$	$\Delta \delta = - 0.14$	$\Delta \alpha = + 0.053$	$\Delta \delta = + 0.69$

The ephemeris of the sun is constructed from HANSEN and OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that STRUVE's aberration has been used. This is equivalent to adding $0''.19$ to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox, 1890.0, are computed by the formulæ,

$$\begin{aligned} \Delta X' &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y' &= - X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' - 9.4 \tau R \sin (\lambda + 187^\circ) \\ \Delta Z' &= - X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' + 21.7 \tau R \sin (\lambda + 187^\circ) \end{aligned}$$

Wherein—

- λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
- ω , the obliquity of the ecliptic;
- $\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
- $\Delta \omega$, the reduction of the mean to the apparent obliquity;
- τ , the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from GOETZE's paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,* is $8''.848$. The adopted semidiameter of the sun at the earth's mean distance is $16' 2''$. In the computations pertaining to eclipses, BESSEL's semidiameter, $15' 59''.788$ has been used.

The right ascension, declination and parallax of the moon are derived from HANSEN's *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with NEWCOMB's *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274 \pi + 2''.5$$

The constant $2''.5$ is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor WINLOCK's *Tables of Mercury*, Washington, 1864. They are based on the older theory of LE VERRIER, published in the *Additions to the Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. HILL's *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from LINDENAU's Tables. Mr. HUGH BREEN's results, contained in his paper *On the Corrections of LINDENAU's Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{10}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{aligned} L &= 320^\circ 13' 33''.87 + 689101''.1527 \ t \\ \pi &= 333 \ 23 \ 17.84 + 65.9990 \ t \\ Q &= 48 \ 25 \ 55.20 + 27.6997 \ t \\ i &= 1 \ 51 \ 2.20 - 0.02141 \ t \\ e &= 19238''.75 + 0.18549 \ t \\ n &= 689050''.8927 \\ a &= 1.5230915 \end{aligned}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from BOUVARD's Tables with such changes as were required to make them correspond more nearly to the formula.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. GEORGE W. HILL, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB's Tables, published by the Smithsonian Institution.

* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1865, Appendix II.*

† *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875, Appendix II.*

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34 "	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	8.546 \pm 0.086	0.00	
Mars	2.842 \pm 0.057	0.25	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Jupiter (polar)	18.78 \pm 0.067	0.70	
Saturn (polar)	8.77 \pm 0.039	0.95	
Uranus	1.68 \pm 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to BESSEL's method, using the special forms in CHAUVENET's *Spherical and Practical Astronomy*. The adopted semidiameters are:—

Semidiameter of the sun at distance unity . . .	959".788
Ratio of radius of moon to radius of earth . . .	0.27227

The eclipses of Jupiter's satellites are computed from TODD's *Continuation of DAMOISEAU's Tables*, Washington, 1876. The occultations, transits, etc., are computed from WOOLHOUSE's *Tables, British Nautical Almanac* for 1835, Table II of each satellite having been adapted to DAMOISEAU's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor NEWCOMB.

The apparent elements of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor NEWCOMB's *Uranian and Neptunian Systems*, Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from BESSEL's elements of the terrestrial spheroid, as adopted in Table III of CHAUVENET's *Spherical and Practical Astronomy*, Vol. II:—

$$\begin{aligned}\log e &= 8.9122052 \\ \varphi' - \varphi &= -11' 30''.65 \sin 2 \varphi + 1''.16 \sin 4 \varphi \\ \log \rho &= 9.9992747 + 0.0007271 \cos 2 \varphi - 0.0000018 \cos 4 \varphi\end{aligned}$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

- (1) An altitude of Polaris equal to 45°.
- (2) A declination of Polaris equal to + 88° 43'.

The principal computations of the Ephemeris have been distributed in the following manner:—

The ephemeris of the sun was computed by the late Mr. EASTWOOD; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor KEITH; right ascension and declination, by Professor VAN VLECK; culminations, by Dr. J. MORRISON and Mr. LOONIS; lunar distances, by the late Mr. J. MEIER; Mercury and Venus, by Mr. E. P. AUSTIN; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. ROBERDEAU BUCHANAN; Jupiter's satellites, by Professor H. D. TODD. The mean and apparent places of the fixed stars were prepared by Mr. H. MEIER; the general constants for their reduction, by Mr. BUCHANAN; the occultations, by Mr. J. O. WIESSNER; and the eclipses were computed and the charts projected by Mr. BUCHANAN.

TABLE I.

**CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S
MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING
TO A CORRECTED LUNAR DISTANCE.**

Approximate Interval.		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52		
h	m	h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s		
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0 10	2 50	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3		
0 20	2 40	0	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3		
0 30	2 30	0	1	1	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	5	5	5	5	5	5	5		
0 40	2 20	0	1	1	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	6	6	6	6	6		
0 50	2 10	1	1	2	2	3	3	3	4	4	4	5	5	5	5	6	6	6	7	7	7	7	8	8	8	8			
1 0	2 0	1	1	2	2	3	3	4	4	4	5	5	6	6	6	7	7	7	8	8	9	9	9	9	9	9			
1 10	1 50	1	1	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	9	9	10	10	10	10	10	10			
1 20	1 40	1	1	2	3	3	4	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	11	11	11			
1 30	1 30	1	1	2	3	3	4	4	4	5	6	6	7	8	8	9	9	10	10	11	11	12	12	12	12	12			
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
h	m	h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s			
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7			
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	12			
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	17			
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21	22			
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	24	25			
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	27	28			
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	29	30			
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31			
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	31			
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
h	m	h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s			
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
0 10	2 50	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9			
0 20	2 40	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	15	15	15	16	16	16	16	16	17	17			
0 30	2 30	18	18	18	19	19	19	19	20	20	20	21	21	21	21	21	21	22	22	22	23	23	24	24	24	24			
0 40	2 20	22	22	23	23	24	24	24	25	25	25	26	26	26	26	27	27	27	28	28	28	29	29	30	30	30			
0 50	2 10	26	26	26	27	27	28	29	29	29	29	30	30	30	31	31	31	32	32	32	33	33	34	34	34	34			
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	35	36	36	36	37	37	38	38	38	38	38			
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	36	37	37	37	38	38	38	39	39	40	40	40	41	41			
1 20	1 40	31	32	33	33	34	34	35	35	36	36	37	37	38	38	39	39	39	40	40	41	41	42	42	42	42			
1 30	1 30	32	32	33	34	34	35	35	36	36	37	37	38	38	39	39	39	40	40	41	41	42	42	42	43	43			

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Sidereal.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.907	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.365	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161
Sidereal.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side- real.	8 ^h .	9 ^h .	10 ^h .	11 ^h .	12 ^h .	13 ^h .	14 ^h .	15 ^h .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0 0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1 0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2 0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3 0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4 0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5 0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6 0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7 0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8 0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9 0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10 0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11 0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12 0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13 0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14 0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15 0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16 0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17 0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18 0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19 0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20 0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21 0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22 0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23 0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24 0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25 0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26 0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27 0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28 0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29 0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30 0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31 0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32 0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33 0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34 0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35 0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36 0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37 0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38 0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39 0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40 0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41 0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42 0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43 0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44 0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45 0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46 0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47 0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48 0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49 0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50 0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51 0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52 0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53 0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54 0.147
55	1 27.647	1 37.476	1 47.306	1 57.135	2 6.965	2 16.795	2 26.624	2 36.454	55 0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56 0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57 0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58 0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59 0.161
Side- real.	8 ^h .	9 ^h .	10 ^h .	11 ^h .	12 ^h .	13 ^h .	14 ^h .	15 ^h .	For Seconds.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Side- real.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161
Side- real.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.
m	m	m	m	m	m	m	m	m	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162
Mean Solar.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	8 ^h .	9 ^h .	10 ^h .	11 ^h .	12 ^h .	13 ^h .	14 ^h .	15 ^h .	For Seconds.
0	1 18.852	1 24.708	1 38.565	1 44.421	1 58.278	2 8.134	2 17.991	2 27.847	0 0.000
1	1 19.016	1 24.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1 0.003
2	1 19.180	1 25.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2 0.005
3	1 19.345	1 25.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3 0.008
4	1 19.509	1 25.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4 0.011
5	1 19.673	1 25.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5 0.014
6	1 19.837	1 25.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6 0.016
7	1 20.002	1 25.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7 0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8 0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9 0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10 0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11 0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12 0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13 0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14 0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15 0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16 0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17 0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18 0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19 0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20 0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21 0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22 0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23 0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24 0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25 0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26 0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27 0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28 0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29 0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30 0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31 0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32 0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33 0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34 0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35 0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36 0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37 0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38 0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39 0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40 0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41 0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42 0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43 0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44 0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45 0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46 0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47 0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48 0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49 0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50 0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51 0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52 0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53 0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54 0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55 0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56 0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57 0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58 0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59 0.162
Mean Solar.	8 ^h .	9 ^h .	10 ^h .	11 ^h .	12 ^h .	13 ^h .	14 ^h .	15 ^h .	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.										
Mean Solar.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.	
m	m	m	m	m	m	m	m	m	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.	

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is $\begin{cases} \text{less than } 1^{\text{h}} 18^{\text{m}}.6, \text{ subtract it from } 1^{\text{h}} 18^{\text{m}}.6; \\ \text{between } 1^{\text{h}} 18^{\text{m}}.6 \text{ and } 13^{\text{h}} 18^{\text{m}}.6, \text{ subtract } 1^{\text{h}} 18^{\text{m}}.6 \text{ from it;} \\ \text{greater than } 13^{\text{h}} 18^{\text{m}}.6, \text{ subtract it from } 25^{\text{h}} 18^{\text{m}}.6; \end{cases}$

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

Example.—1890, November 10, at $9^{\text{h}} 29^{\text{m}} 29^{\text{s}}$, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be $29^{\circ} 29'$: required the latitude of the place.

Local astronomical mean time	$9^{\text{h}} 29^{\text{m}} 29^{\text{s}}$
Reduction from Table III, for $9^{\text{h}} 29^{\text{m}} 29^{\text{s}}$	+ 1 34
Greenwich sidereal time of mean noon, November 10, page 183	15 18 22.9
Reduction from Table III, for longitude ($= 1^{\text{h}} 56^{\text{m}}$ east, or minus)	— 0 19
Sum (having regard to signs) is equal to local sidereal time	$0 49 6.9$
	$1^{\text{h}} 18^{\text{m}} 36.0$
Subtract sidereal time	$0 49 6.9$
Remainder is equal to hour-angle of Polaris	$0 29 29.1$
True altitude	+ $29^{\circ} 29'$
Correction from Table IV.	— 1 16.3
Approximate Latitude	+ $28 12.7$

TABLE IV—1890.

Hour-Angle.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .
m						
0	— 0 17.0	— 0 14.3	— 0 6.5	— 0 54.1	— 0 37.8	— 0 19.1
5	1 17.0 0.0	1 13.8 0.5	1 5.6 0.9	0 52.9 1.2	0 36.3 1.5	0 17.5 1.6
10	1 16.9 0.1	1 13.3 0.5	1 4.7 0.9	0 51.6 1.3	0 34.8 1.5	0 15.8 1.7
15	1 16.8 0.1	1 12.8 0.6	1 3.8 1.0	0 50.3 1.3	0 33.3 1.5	0 14.2 1.7
20	— 1 16.7 0.2	— 1 12.2 0.6	— 1 2.8 1.0	— 0 49.0 1.3	— 0 31.8 1.5	— 0 12.5 1.6
25	1 16.5 0.2	1 11.6 0.6	1 1.8 1.0	0 47.7 1.3	0 30.3 1.5	0 10.9 1.7
30	1 16.3 0.2	1 11.0 0.7	1 0.8 1.1	0 46.4 1.4	0 28.8 1.5	0 9.2 1.7
35	1 16.1 0.3	1 10.3 0.7	0 59.7 1.1	0 45.0 1.4	0 27.2 1.6	0 7.6 1.6
40	— 1 15.8 0.3	— 1 9.6 0.7	— 0 58.6 1.1	— 0 43.6 1.4	— 0 25.6 1.6	— 0 5.9 1.7
45	1 15.5 0.3	1 8.9 0.7	0 57.5 1.1	0 42.2 1.4	0 24.0 1.6	0 4.2 1.7
50	1 15.1 0.4	1 8.1 0.8	0 56.4 1.1	0 40.8 1.5	0 22.4 1.6	0 2.5 1.7
55	1 14.7 0.4	1 7.3 0.8	0 55.3 1.1	0 39.3 1.5	0 20.8 1.6	— 0 0.8 1.7
60	— 1 14.3 0.4	— 1 6.5 0.8	— 0 54.1 1.2	— 0 37.8 1.5	— 0 19.1 1.7	+ 0 0.9 1.7
Hour-Angle.	6 ^h .	7 ^h .	8 ^h .	9 ^h .	10 ^h .	11 ^h .
m						
0	+ 0 0.9	+ 0 20.7	+ 0 39.1	+ 0 54.9	+ 1 6.9	+ 1 14.4
5	0 2.6 1.7	0 22.3 1.6	0 40.5 1.4	0 56.0 1.1	1 7.7 0.8	1 14.8 0.4
10	0 4.3 1.7	0 23.9 1.6	0 41.9 1.4	0 57.1 1.1	1 8.5 0.8	1 15.2 0.4
15	0 6.0 1.7	0 25.5 1.6	0 43.3 1.4	0 58.2 1.1	1 9.2 0.7	1 15.6 0.3
20	+ 0 7.6 1.7	+ 0 27.1 1.6	+ 0 44.7 1.4	+ 0 59.3 1.1	+ 1 9.9 0.7	+ 1 15.9 0.3
25	0 9.3 1.7	0 28.7 1.6	0 46.1 1.4	1 0.4 1.0	1 10.6 0.7	1 16.2 0.3
30	0 11.0 1.7	0 30.3 1.6	0 47.4 1.3	1 1.4 1.0	1 11.2 0.6	1 16.4 0.2
35	0 12.6 1.6	0 31.8 1.5	0 48.7 1.3	1 2.4 1.0	1 11.8 0.6	1 16.6 0.2
40	+ 0 14.2 1.7	+ 0 33.3 1.5	+ 0 50.0 1.3	+ 1 3.4 0.9	+ 1 12.4 0.5	+ 1 16.7 0.1
45	0 15.9 1.6	0 34.8 1.5	0 51.3 1.2	1 4.3 0.9	1 12.9 0.5	1 16.8 0.1
50	0 17.5 1.6	0 36.3 1.4	0 52.5 1.2	1 5.2 0.9	1 13.4 0.5	1 16.9 0.1
55	0 19.1 1.6	0 37.7 1.4	0 53.7 1.2	1 6.1 0.8	1 13.9 0.5	1 17.0 0.1
60	+ 0 20.7 1.6	+ 0 39.1 1.4	+ 0 54.9 1.2	+ 1 6.9 0.8	+ 1 14.4 0.5	+ 1 17.0 0.0